[COMMITTEE PRINT]

OVERSIGHT VISIT TO THE SOUTHERN PACIFIC RIM

REPORT

TO THE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED FIRST CONGRESS

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LETTER OF TRANSMITTAL

U.S. HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC, December 1990.

To All Members, Committee on Science, Space, and Technology:

I hereby transmit this oversight review of science and technology programs and policies in South Pacific countries visited during the period of November 8 through November 23, 1990.

The review included a series of policy meetings with key science and technology officials in both Australia and New Zealand. In Australia, the focal point of the Codel's visit was space cooperation, particularly pertaining to the proposed Cape York Spaceport project. In New Zealand, the delegation undertook critical review of the U.S. Antarctic program, which is logistically based in Christchurch. Following these meetings, the delegation met with key U.S. officials in Hong Kong to review the status both of Hong Kong's political and economic situation and of U.S./China relations.

In addition, during the trip, Mr. Hughes (a Member of the Judiciary Committee) participated in a number of drug-related meetings, and Mr. Roe and Mr. Shuster (Members of the Intelligence Committee) received intelligence briefings or visited intelligence installations.

A detailed documentation of all meetings appears herein for Members' review and consideration.

Sincerely,

ROBERT A. ROE, *Chairman.*

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MEETING: Easter Island, Chile

DATE: November 9, 1990

KEY OFFICIALS: Mr. Perry Ball, Economic Officer
U.S. Embassy, Santiago, Chile

Mr. Carlos Capurro, Science Officer
U.S. Embassy, Santiago, Chile

BACKGROUND:

The delegation made an overnight mandatory crew-rest stop in Easter Island en route to Christchurch, New Zealand.

Messrs. Ball and Capurro met the delegation in Easter Island and provided a tour of the Mataveri Airport Shuttle Emergency Landing Site and other local cooperative research activities. An agreement between the U.S. and Chile, signed in August 1985, permits use of the Mataveri Airfield, Easter Island, as an emergency landing site for the Space Shuttle in launches from Vandenberg AFB. Vandenberg is presently in a stand-down mode. It would require 48 months to activate Vandenberg for a Shuttle launch, although DOD has no plan at present to do so.

Messrs Ball and Capurro also briefed the delegation on the following U.S./Chile cooperative activities:

1. NASA Crystal Dynamics and Plate Tectonics

This study measures the movements of the Earth's plates and keeps track of the magnitude and direction of those movements. These measurements are made with the use of a mobile Tracking Laser Ranging System (TLRS) currently stationed at Easter Island (the TLRS system is moved back and forth from Easter Island and Tahiti every three months).

2. NASA MATAVERI Airport: Emergency Landing Site for Polar Orbiting Space Shuttle

NASA signed an agreement in 1985 with the GOC permitting the use of the Mataveri Airport runway as an alternative emergency landing site in the Southern Pacific Ocean for Polar Orbiting Space Shutties. NASA funded an extension of the Mataveri Airport runway and also provided the airport with modern approach guidance lights system for landing support. This facility is the only emergency landing site for Polar Orbiting Space Shuttles, when flying over the Pacific Ocean. Article 19 of the "Mataveri Agreement" calls for increased scientific cooperation between NASA and Chile. Subsequently scientists have held three rounds of conversations (Santiago, Washington, Santiago) to identify areas for potential scientific cooperation between NASA and the GOC.

3. **NOAA Climatic and Oceanographic Research in the Vicinity of Easter Island**

The Ocean Climate Research Division of NOAA performed a marine research cruise on board the R/V DISCOVERER to assess how the ocean influences the atmospheric concentrations of climate-linked trace gases such as carbon dioxide, carbon monoxide, methane, ozone and several others. These gases affect the radiative balance of the planet, controlling the Earth's temperature.

4. **CHILEAN METEOROLOGICAL DIRECTORATE - CHILE**
Southern Pacific Ocean meteorological observation and weather modeling

The Chilean Meteorological Directorate (CMD) has a permanent weather station to monitor meteorological conditions in situ. Also the CMD collects airdust samples to monitor air pollution. In a cooperative action, CMD sends to NOAA on a regular basis the collected airdust samples for processing. Data and information feed the Chilean Meteorological Directorate Database, and ultimately this data is dumped in to the NOAA and World Meteorological Organization computer databases.

5. **IN GENERAL.**

Easter Island's remoteness makes it an interesting laboratory. For example, its remoteness, like Antarctica, provides a unique location to carry out environmental research, whether air or ocean studies. Another possibility, studying islanders life from different aspects like health for example, could provide unique opportunities for scientific research in biomedicine and biosciences in general. However, the leading economic activity on the Island, tourism, threatens its scientific value. A number of investors (mostly foreign) are studying the economic feasibility of tourism investments. If any of these take place, it will have a major environmental impact on the local native population and its culture, Which is not only Chile's concern, but the world's.

MEETING: New Zealand Country Team Briefing and Reception with New Zealand Officials Christchurch, New Zealand

DATE: November 11, 1990

KEY OFFICIALS: Della M. Newman, U.S. Ambassador to New Zealand
David M. Walker, Political Counselor
William J.A. Barnes, Public Affairs Counselor
John T. Hopkins, Agricultural Attache

BACKGROUND:

Originally established as a British colony, New Zealand has historically enjoyed generally good relations with the United States. The particularly strong ties between the two countries, that existed during and after World War II when the United States' Second Marine Division was based in Wellington and fought side-by-side with their New Zealand allies in the Pacific Campaign, have weakened somewhat in recent years over nuclear weapons policy disagreements. Nonetheless, despite what so far has been an impasse over nuclear weapons policy, the United States and New Zealand continue to enjoy good relations on other issues. Like the United States, New Zealand is a strong supporter of free trade in agriculture in the Cairns group and at the General Agreement on Tariffs and Trade (GATT) Uruguay round. The two countries have an extensive program of scientific cooperation, particularly in Antarctic research. Tourism is strong, with approximately 200,000 New Zealanders ("Kiwis") visiting the United States each year and 50,000 Americans visiting New Zealand. Just prior to the CODEL's arrival in Christchurch, the political landscape in the country changed significantly as the conservative National Party assumed the government leadership reins from the Labour Party in the biggest general election landslide in New Zealand history.

GOVERNMENT POLITICS:

New Zealand has a unicameral parliamentary system of government, with 97 Members of its House of Representatives each normally elected for 3-year terms and each representing approximately 30,000 constituents. On October 27, two weeks before CODEL Roe's arrival in New Zealand, a general election was held which completely reversed the status of the Labour and National parties. After six years in power and three different prime ministers during the previous eighteen months, the Labour Party retained only 28 of its previously-held 57 seats in Parliament, while the National Party increased its representation from 40 to 68 seats. The breakaway New Labour Party retained its one seat. Of 46 Labour Members of Parliament running for reelection, 25 lost their seats; all sitting National MP's were reelected. On November 1, Prime Minister James Bolger and his cabinet were sworn into office.

Recent election results aside, the New Zealand political situation relative to its historical origins and the philosophical underpinnings of the two main parties is in turmoil. The Labour party, which had introduced the welfare state in the 1930's, came into power in 1984 determined to remove many of the controls and regulations in the economy which had been put in place by the "conservative" government of National party PM Sir Robert Muldoon from 1975-84. Then-Finance Minister Roger Douglas led the charge to remove banking controls, reduce tariffs, drop subsidies and free interest

and exchange rates.[1]

The initial result of Labour's new policies was a boom, with Labour's greatest sort-term achievement being a resolution of the rate of inflation from its peak of more than 18 percent to an underlying rate of 5.4 percent, excluding the effects of changes in the rate of the value added tax. This success, however, was achieved at the cost of high interest rates which strangled growth and contributed to the most of the current economic difficulties. The 1987 stock market crash and the subsequent recession have led to a questioning of the free-market philosophy from within the government. Prime Minister Lange and Finance Minister Douglas embarked on an 18 month feud which split the government and ended in the departure of both men from Cabinet.

While in opposition, the National Party moved to reclaim its position on the economic right, arguing that in some cases (labor market reform, in particular) the Labour government had not gone far enough. Nevertheless, the National Party parliamentary caucus contains a number of people who would like to see a return to a more "managed" economy with subsidies and other protectionist measures (the "wets") and there will be divisions if the economy does not respond soon. The new National Party government faces a number of severe economic problems: record high unemployment of over 7.5 percent; interest rates over 15 percent; deteriorating terms of trade; and a projected budget deficit of over USD 1.2 billion (some say perhaps as high as $2 billion USD). For now, it appears that the National government will continue Labour's free market reform and is likely to extend deregulation into the labor market by abolishing compulsory trade union membership and replacing centralized bargaining with workplace negotiations based on productivity agreements.

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[1]The framework of economic decision-making in New Zealand changed significantly since 1984 when the National Party turned over to the Labour Party control of one of the most tightly-regulated economies in the Organization for Economic Cooperation and Development (OECD). While in power, Labour:

- Cut protective tariffs from an average of 28 percent to 20 percent, abolished import quotas and agricultural subsidies, and halved export subsidies to industry.
- Restructured state-owned enterprises as free-standing commercial business, and privatized assets worth NZ$9.7bn, including Air New Zealand, NZ Telecom, the State Insurance Office and the Post Office bank.
- Halved the top rate of marginal tax on personal income to 33 percent, cut the corporate rate from 45 percent to 33 percent, and widened the tax base by introducing value added tax.
- Abolished foreign exchange and interest rate controls, liberalized the banking system and floated the NZ dollar.
- Established the independence of the Reserve Bank, and legislated to require it to direct monetary policy towards achieving price stability, defined as 0.2 percent inflation.

See Financial Times, October 30, 1990, p. 6.

NUCLEAR WEAPONS POLICY:

While in general relations between the United States and New Zealand are good, interaction on defense/security issues is strained by New Zealand's policy since 1984 prohibiting port visits by nuclear-powered or armed warships without assurances by the warship's parent country that no nuclear weapons were being carried aboard the ship.

New Zealand's relationship with the United States following World War II has been closely associated with the Australian, New Zealand, United States (ANZUS) security treaty signed in 1951, which commits the three countries to consult in case of an attack in the Pacific and to act to meet the common danger. Under ANZUS, access to New Zealand ports by U.S. vessels contributed significantly to the flexibility and effectiveness of U.S. naval focus in the Pacific.

As a result of growing concern about nuclear and arms control issues, when the Labour government came to power in 1984, it adopted a policy, which was codified in 1987, effectively banning the visits of nuclear-powered or nuclear-capable warships in order to protest military use of nuclear power. The government contended that New Zealand's location, far from potential adversaries, rendered any nuclear defense of New Zealand unnecessary and unwarranted. New Zealand's anti-nuclear policy specifically contravened a long-standing, worldwide U.S. policy of neither confirming nor denying (NCNO) the presence or absence of nuclear weapons on-board U.S. vessels.[2] On August 11, 1986, after extensive efforts to resolve the port access issue were unsuccessful and after concluding that absent agreement on the matter practical alliance cooperation and U.S. implementation of defense commitments to New Zealand were precluded, the U.S. announced it was suspending its security obligations to New Zealand under ANZUS, pending adequate corrective measures.[3]

Despite suspension of U.S. security obligations, the legal framework and structure of ANZUS remains intact in the event that trilateral defense cooperation is reestablished. The U.S. is pursuing a low-key approach toward a more limited relationship with New Zealand, based on reciprocity and treatment of New Zealand as a non-allied friend. Sharply curtailed defense and security cooperation with New Zealand continues, but New Zealand has lost the special access and influence normally accorded an ally. For example, the nuclear ban policy has effectively precluded the New Zealand Prime Minister from being installed to the White House, a situation which the State Department reports has caused some popular resentment in New Zealand.[4]

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[2]More than 40% of U.S. naval combatants are nuclear-powered, and that proportion is growing.

[3]According to the State Department, the U.S. position has been and is that, while we share New Zealand's concern about the risk of nuclear war and have emphasized our deep desire to reduce and eventually eliminate nuclear weapons, the New Zealand port policy undermines the very security arrangements designed to prevent war and therefore harms, rather than helps, our efforts to achieve arms control goals. The United States considers its NCND policy essential to avoid providing potential adversaries with critical intelligence about our most militarily capable ships. Further, we have not been able to accept the New Zealand argument that alliance status is compatible with highly selective security cooperation.

For its past, New Zealand has reaffirmed the importance it attaches to further development of political, economic, and social ties among the ANZUS partners. It has also asserted that it is prepared to meet regional and ANZUS security responsibilities through conventional, as opposed to nuclear, defense. However, at this time it does not appear likely that the recent elections and shift of government power to the National Party will lead quickly to a reversal of New Zealand's port access policies. The new government has said it will retain the anti-nuclear legislation,[5] but still wants to build "mutually acceptable" defense relations with the United States.[6] One possible mechanism for relaxing the policy that was discussed during the CODEL visit was reinterpretation by the new government of what is necessary to meet the anti-nuclear legislation's requirement that the New Zealand government must satisfy itself--through what was reported to be a statutorily undefined rather than specifically determined mechanism--that the provisions of the law are being met. Any policy change, however, would need to recognize the strong opposition in most of the New Zealand electorate--currently, approximately 70%--to nuclear weapons.

SCIENTIFIC COOPERATION:

The U.S./New Zealand Science and Technology (S&T) Cooperation Agreement, first signed in Wellington in 1974 and then renewed by an exchange of notes in February 1979 and February 1984, funds about 65 projects annually, bringing U.S. and New Zealand scientists together to work on projects of mutual interest. While the S&T Agreement funds projects in all sciences, cooperation under the Agreement has focused mainly on ocean sciences, agriculture, and natural hazards, with two areas having received the bulk of the funding:

- Geosciences, where we are interested in geological phenomena such as earthquakes and volcanoes and where New Zealand's unique geology offers a fascinating laboratory to U.S. scientists; and

- Biological sciences, where New Zealand's strength derives from its heavy emphasis on agricultural research.

In 1988, prior to the February 1989 expiration of the S&T Agreement, the USG presented the Government of New Zealand with a proposal to amend the Agreement with Intellectual Property Rights (IPR) and Security Obligations language. (Security Obligations language precludes transfer of security and defense related technology under this Agreement.) In February 1989, the Agreement was granted a six-month extension

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[4]While high-level political and security contacts are still constrained, the situation may be improving slightly. In March of this year, Secretary of State Baker met with than Foreign Minister Mike Moore to discuss trade and narcotics matters.

[5]State Department representatives indicated that the U.S. response has been an expression of interest in listening to what the new government has to say while continuing to make clear that we cannot compromise our global responsibilities or carve out a special exception or arrangement for New Zealand related to our NCND policy.

[6]Not surprisingly, the New Zealand military, because of World War II and other experiences, is generally desirous of quickly restoring security relations.

to allow time for negotiations on IPR and Security Obligations language. Subsequent six month extensions were granted in August 1989 and February 1990.

In May 1990, the USG presented the GONZ with a new proposal for IPR language (a streamlined IPR Annex). By utilizing diplomatic channels, the U.S. Government and Government of New Zealand have agreed on a majority of the IPR language. To allow time to resolve the few remaining points of difference, a six month extension was granted in August 1990. Negotiations are expected to be completed before the February 27, 1991 expiration of the current extension.

In addition to the umbrella agreement a number of individual U.S. Government departments and agencies have their own programs:

- The U.S. Department of Agriculture (USDA) has a separate S&T Agreement with New Zealand's Department of Scientific and Industrial Research (DSIR) and the Ministry of Agriculture and Fisheries (MAF) which funds dozens of researchers in agriculture each year. Included in USDA's program under this agreement are separate memoranda of understanding with New Zealand on dry milk products certification for export to the U.S. and on shellfish sanitation and certification for export to the U.S., including annual inspection of growing areas and processing facilities.

- The U.S. Geological Survey has extensive contact with its New Zealand counterpart, including a joint project to map regions of high scientific interest in the McMurdo Sound area of Antarctica and numerous exchanges of scientists.

- NASA sends several aircraft annually to Harewood Airport in Christchurch both for observing the Southern sky and for taking atmospheric samples above the Southern oceans.

- NOAA has extensive relationships with New Zealand atmospheric scientists and sends scientists to New Zealand's atmospheric observatory at Lauder in the South Island. A NOAA research vessel visited Wellington in March 1989 while measuring the incidence of freon gases in the Southern Ocean.

- The U.S. Department of Defense maintains contact with the New Zealand Defense Research Establishment in a variety of fields. In addition, the U.S. Navy operates an observatory at Black Birch at the northern end of the South Island. Five astronomers from the National Observatory in Washington serve at Black Birch.

- NSF participates in projects under the S&T Agreement on joint research, information and personnel exchange and utilization of installations. NSF also has an MOU with the New Zealand Meteorological Service involving the launching of scientific balloons and ballooning techniques aimed at the development of new techniques for measurement in support of atmospheric and scientific studies an meteorological services.

ANTARCTIC POLICY:

The United States has been actively engaged in research based in Antarctica since the International Geophysical Year (IGY) of 1957-1958. Following the IGY, the U.S.

established its United States Antarctic Research Program (USARP), which has operated continuously to this day and which is managed and funded by the National Science Foundation (NSF).[7] The 1990-1991 USARP will support 454 scientists, who will conduct 111 science projects. Most of the research teams have been selected by NSF from U.S. universities, although some come from other federal agencies and other organizations. Work will be done in some cases with researchers and teams from New Zealand and other government agencies involved in scientific efforts in Antarctica.[8]

USARP research is conducted under the terms of the Antarctic Treaty to, among other things, recognize "...that it is in the interest of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord." While, without any provisions for policing or military enforcement, the treaty is being honored, it cannot be said that there is total agreement among all of the ratifying countries and other Treaty Consultative Parties on all issues.

The single most contentious issue currently facing the consultative parties deals with mining activities in Antarctica.[9] The Convention for the Regulation of Antarctic Mineral Resource Activities (CRAMRA), signed but not ratified by the U.S., has drawn fire in the past year as not being strict enough protection for the Antarctic. A number of countries, led by Australia and France and now including New Zealand, have rejected CRAMRA and called for a permanent ban on mining. The U.S. is advocating a moratorium or indefinite ban, which incorporates CRAMRA principles, rather than a permanent ban. This matter is being addressed by the consultative parties in Santiago,

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[7]For a more detailed discussion of the history and specifics of the U.S. Antarctic Research Program, see the following section of this report.

[8]The following New Zealand government agencies are involved in scientific efforts in Antarctica:

- The Ministry of Research, Science and Technology (MORST) provides advice to the government on science policy. The 30-odd staff are involved in no actual scientific research and do not directly fund research. They provide the policy framework under which other agencies conduct and fund research. (Minister Simon Upton; Dr. Basil Walker, Chief Executive).

- The Foundation for Research, Science and Technology is an independent, statutory body, which funds scientific research under a competitive bidding process. In judging applications for research grants it formulates criteria based on policy promulgated by MORST. It does not deal directly with Antarctic research proposals, but funnels its funds through the Ross Dependency Research Committee. (Dr. Ron Arbuckle, Chairman).

- The Ross Dependency Research Committee (RDRC) selects scientific research projects for New Zealand's Antarctic program under a modified peer review process. Three scientific committees (biological sciences, physical sciences and geosciences) evaluate the proposals and make funding recommendations. Then all proposals are vetted by the environment committee, which evaluates their potential environmental impact, before the full RDRC makes final funding

(Footnote continued)

Chile (November 13 to December 7, 1990).[10]

Environmental issues also figure heavily in the Santiago discussions, including work on a Comprehensive Environmental Protection (CEP) Regime for Antarctica. The U.S. favors an umbrella protocol to the Treaty, with separate agreements for different environmental issues. Some other countries, including New Zealand (which has written its own alternative draft), favor a more detailed protocol. Still others, led by Australia and France, advocate a separate treaty.

One of the principal U.S. goals at Santiago is to ensure that the environmental protection discussion does not get bogged down with the mining issue, but moves on to discuss comprehensive environmental protection. A number of other activities including tourism pose a far more immediate threat than mining to the Antarctic, according to Administration representatives.

While the principal U.S. interest in the Antarctic continues to be scientific research, State Department representatives explained that the U.S. position attempts to ensure that any CEP regime put in place would not unduly interfere with legitimate scientific research.

BILATERAL ENVIRONMENTAL COOPERATION:

The United States and New Zealand work together both bilaterally and in multilateral form on a number of global environmental issues. In February 1990, U.S. and New Zealand officials held two days of bilateral talks in Washington to further their cooperation. Since then the two countries have worked together in a number of U.N. organizations and hope to start some new bilateral exchanges.

One major area of mutual interest has been halting driftnet fishing on the high seas.

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[8](continued)
decisions. (Dr. Bob Norman, Chairman).

- The Department of Scientific and Industrial Research (DSIR). The Antarctic Division of DSIR provides logistic support for the New Zealand Antarctic program. It is headquartered at the International Antarctic Gateway Centre in Christchurch and maintains Scott Base, which is near our McMurdo Base, in Antarctica. (Minister Denis Marshall; Dr. Mike Collins, Director-General; Mr. Hugh Logan, Director, Antarctic Division).

[9]The disagreement is being treated quite seriously by the Australian press. For example, the November 16, 1990, edition of The Australian headlined its article on the matter in terms of "U.S. reneges on mining ban in Antarctica", while the November 21, 1990, edition of The Canberra Times characterized the issue as "...the first serious rift since the (Antarctic) treaty was signed..."

[10]The Antarctic Policy Group (APG) serves as the policy guidance body for all U.S. activities under the Antarctic Treaty. The State Department chairs the APG with other members consisting of representatives of NSF; the Departments of Commerce, Interior and Justice; the Marine Mammal Commission; and EPA. In Antarctic treaty negotiations, APG represents the U.S., led by the Assistant Secretary of State for Oceans, International Environment, and Scientific Affairs (currently Curtis Boehlen).

Both the U.S. and New Zealand are strongly opposed to driftnet fishing, and New Zealand has been one of the leaders in the South Pacific in efforts to have the practice banned. The U.S. worked closely with New Zealand and others in the formulation of the 1989 United Nations Ground Assembly Resolution which addresses the problem of driftnet fishing on a global basis. New Zealand led negotiations of the Wellington Convention calling for a ban on driftnet fishing in the South Pacific. Thirteen countries have signed the Wellington Convention, and President Bush announced at the Pacific Summit in Honolulu October 27 that the U.S. would sign. This issue was a highly politicized one in 1988 and 1989, but the problem to a considerable extent has been resolved by the announcements of Japan and Taiwan that they will cease driftnet fishing in the region.

The U.S. and New Zealand are also working closely on the issue of global climate change. New Zealand has been active in the Inter-governmental Panel on Climate Change (IPCC) and will continue to participate fully in the drafting on the Framework Convention, which begins in Washington in February 1991.

New Zealand and the U.S. have cooperated for years at the International Whaling Commission. Both countries' Commissioners are in very close communication. They are also working together in the preparative conferences (prepcons) leading up to the United Nations Conference on Environment and Development (UNCED) in 1992. Major areas of mutual interest include oceans and seas and the protection of biodiversity.

U.S. and New Zealand scientists work together on environmental issues both through interagency cooperation and privately. A U.S. contingent representing the Environmental Protection Agency and several universities attends the annual conference of the Clean Air Society of Australia and New Zealand. NOAA scientists have worked closely with counterparts from the Department of Scientific and Industrial Research (DSIR) to measure the ozone hole.

MEETING: United States Antarctic Program
Christchurch, New Zealand

DATE: November 12, 1990

KEY OFFICIALS: Dr. Charles Paul, National Science Foundation Representative for the U.S. Antarctic Program

Commander Bryan White, USN, Naval Support Force Antarctica

Mr. Hugh Logan, Director, New Zealand Antarctic Program

Mr. George Bellew, Chief Executive Officer, Christchurch International Airport, Ltd.

BACKGROUND:

An American, Nathaniel Palmer, is one of three claimants to the first sighting of the actual Antarctic landmass (November 17, 1820). The United States Exploring Expedition of 1836 managed to map some 2400 kilometers of the East Antarctic coast while circumnavigating the continent. Other significant contributions to knowledge of the Southern Continent came with the last great epics of exploration, led by Roald Amundsen, Sir Robert Falcon Scott, Sir Ernest Shackleton and Sir Douglas Mawson. Prevailing opinion on the value of Antarctica in the early part of this century, however, was summed up by one of Admiral Richard E. Byrd's lieutenants, George Dufek. Asked by the Admiral his impression of the continent, he is said to have replied, "It's a hell of a lot of ice. But what good is it?"

The National Science Foundation (NSF) has overall management responsibility for the U.S. Antarctic Program (USAP). The Committee on Science, Space, and Technology, by virtue of its authorization authority for NSF, has jurisdiction over the U.S. program. Accordingly, the Committee requested briefings on U.S. activity in the Antarctic and inspected new facilities at the forward support base in Christchurch, New Zealand.

ANTARCTIC SCIENCE:

The U.S. scientific program in the Antarctic began with the International Geophysical Year (IGY) of 1957/58, an international effort to study the effect of a solar maximum on Earth's atmosphere. Since then, the Antarctic research effort has broadened to cover astronomical, climate and biological studies. In 1984, NSF Director Erich Bloch responded to National Science Board criticism of the Antarctic Program by appointing Peter Wilkniss to be Director of the Division of Polar Programs. In the intervening six years the Program has seen a doubled budget, strong competition for research grants, replacement of the research vessel *Hero* with the *Polar Duke* and construction of a new 46,000 square foot science laboratory at McMurdo Station scheduled for dedication in the 1991 field season.

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Dr. Paul began his presentation with the objectives of the U.S. program: to maintain the Antarctic Treaty, to support cooperative scientific research, to make use of the unique Antarctic environment as a check on human changes to the global climate, to implement the new environmental initiatives approved by Congress in the Fiscal Year 1990 budget, and to insure wise use of Antarctic resources. Policy for the USAP is set by the Antarctic Policy Group, consisting of representatives from the Department of State, NSF, and the Department of Defense (DOD).

The FY1989 budget for the program was $151 million. Of this, $20 million was available for direct support of scientific research. The remainder of the budget went to bring scientists to the continent and maintain them there in the teeth of one of the most hostile environments on Earth. NSF reimbursed DOD $75 million for logistic support (see below), and $2.3 million to the Coast Guard for icebreaker service. NSF's new contractor, Antarctic Services Association, earned $51 million for operations at the Amundsen-Scott South Pole Station, Palmer Station on the Antarctic Peninsula, the research vessel *Polar Duke*, and other services. In the FY1991 HUD, VA and Independent Agencies appropriation Congress provided $175 million to NSF for the Antarctic Program. Of this, $100 million will be available for reimbursement of Navy and Coast Guard logistic support. The appropriation matched the requested budget. In the 1990 Antarctic summer, the NSF will support 111 scientific projects (up from last season's 94) involving 454 scientists.

Reflecting the broad sweep of U.S. Antarctic science, Dr. Paul opened with biological studies involving the Antarctic cod, whose bloodstream contains a natural antifreeze. He also noted that research into the Weddell seal was providing insights into the mysteries of Sudden Infant Death Syndrome. How the seal prepared itself for deep dives apparently resembles the respiratory responses of infants at risk for so-called "crib death."

The oceans surrounding Antarctica are one of the richest ecosystems in the world, supporting a wide variety of species. One species, krill (*Euphasia superba*), is of special interest since it is the primary food for many other species. Soviet and Japanese trawlers harvest krill for processing into food supplements. Dr. Paul indicated that the level of krill stocks and possible overfishing increasingly concern U.S. researchers. NSF has funded a five-year multidisciplinary study to gain better information on these questions. Dr. Paul told Mr. Volkmer that the situation would remain a major problem, as would the diatoms that serve as the food for krill. In answer to Mr. Hughes's question, he said that overfishing was a problem that extended beyond the Antarctic Treaty area and would likely require a solution outside the Treaty system.

Astronomers have found Antarctica a ready source of meteorites. Those recovered from the ice are sent to the Johnson Space Center. Evidence indicates that some are fragments of the Moon's surface that arrived on Earth after asteroid impact; one may even have reached Earth from Mars.

Antarctica's isolation minimizes the impact of humans on the continent. This has proven a boon to climate researchers, as Dr. Paul discussed. Trapped in the Antarctic

icecap are miniature air bubbles containing samples of the Earth's atmosphere at the time the ice was formed. By drilling into the icecap, scientists can recover these air samples and compare them to present-day atmospheric composition. The result is an understanding of how the atmosphere has changed as humanity has increased the load of carbon dioxide and other greenhouse gases emitted from farms and factories. Also, by examining changes in the concentration of oxygen isotopes in the ice, a record of temperature can be developed to compare to the changes in the atmospheric gas balance. Both items are vital to a better understanding of the possible changes in Earth's climate over the next century.

Antarctic science came to world attention in 1985 when the British Antarctic Survey reported that ozone levels over the continent dropped significantly as the Sun reappeared in the Antarctic. This finding, confirmed by data from the U.S. *Nimbus 7* satellites, apparently validated scientific concerns that chlorofluorocarbon releases into the atmosphere damaged the Earth's thin shield against solar ultraviolet radiation (UV). Since 1987, NSF has maintained an intensive monitoring program during the short research season between August and January. This year researchers reported another record low in the "ozone hole." Dr. Paul stated that *Nimbus 7* data monitoring and analysis continues.

Dr. Paul told Chairman Roe that USAP supports a year-round presence of 120 people at McMurdo Station. Twenty people overwinter at the South Pole station to pursue crustal dynamics studies. NSF instituted a 20% reduction in logistics staff overwintering in the 1990 season, with an eventual goal of 50%. Paul indicated this decision was influenced by outside pressure on NSF and that he was personally uncomfortable about the increasing level of automation the Program would rely upon. It could prove critical to staff safety in the event of an accident. Asked by the Chairman the source of this pressure, Paul pointed to environmental groups supporting the "World Park" concept. He stated that this initiative had led some to conclude the Antarctic ecosystem could not handle the number of people already there.

Asked about the new ice-capable research ship, the *Nathaniel B. Palmer*, Dr. Paul indicated that construction was underway and NSF expected delivery in 1992.

LOGISTIC SUPPORT:

The Navy, said Commander White, has been involved in Antarctic support since 1928, when Commander Richard E. Byrd led his first major expedition to the continent. Admiral Byrd would later command Operation Deep Freeze, the logistics support effort for the IGY. Today, Commander White's Deep Freeze operation encompasses 35 buildings in Christchurch housing Naval Support Force Antarctica and Antarctic Development Squadron 6 (VXE-6). He commands 41 year-round Naval staff, rising to 225 during the summer peak. His staff also includes 45 New Zealanders. He expends about $1.5 million for annual payroll and issues $20-25 million in local contracts.

In an average year, Naval Antarctic Support Unit terminal operations will process approximately 2000 people for transportation to Antarctica and will conduct 110 flights between Christchurch and McMurdo. Commander White is also responsible for 2

Armed Forces TV networks and the Fleet Post Office, as well as all communications traffic to and from Antarctica. The U.S. provides aircraft weather briefings for all nations. White also manages supply, public works and minor medical activities.

Supplies reach Christchurch aboard Air Force C-5A and C-141 aircraft from Hawaii. Some of these flights then proceed on the five-hour flight to McMurdo, the major U.S. depot and transshipment point for supplies. VXE-6, the "world's southernmost airline," handles aircraft transportation on the continent. It is presently equipped with seven LC-130 Hercules fixed-wing aircraft and six UH-1N Huey helicopters. The squadron responds to all search and rescue or medical evacuation requests; Commander White is also lead search-and-rescue coordinator on the continent. This reduces the support available to the U.S. science program. White told Mr. Schuster he is not aware of reimbursements from other countries for this U.S. service.

The Coast Guard sends one of its two icebreakers to Antarctica in January. Commander White estimates thirty days would elapse before help could arrive if the icebreaker ran into trouble. Upon arrival, the icebreaker clears a path to McMurdo for the container ship *Green Wave*. *Green Wave* loads supplies at Port Waimea, California, and takes on additional stores at Lyttleton Harbor, New Zealand. At McMurdo, the ship unloads supplies sufficient to last 18 months; this includes 6 million gallons of fuel oil.

Commander White responded to a question about drug violations by stating that abuse of controlled substances is not a significant problem in the program. In cases where a dog might identify luggage belonging to military personnel, Commander White had authority to search those bags. The Navy may also ask permission to search civilian luggage. If denied, NSF officials are notified and the New Zealand police informed. New Zealand Customs inspects incoming mail and Commander White does not receive information on their findings.

Commander White also discussed the facility maintained by the environmental organization Greenpeace at Cape Evans. Established in 1986, Greenpeace monitors operations in the Ross Sea area. Four people, from the U.S., New Zealand and Europe, tend to stay year round. The US Antarctic Program offers no formal support to non-governmental organizations on the continent, but the Greenpeace resupply ship tends to follow the Coast Guard icebreaker each year. Commander White also reported a near-midair collision between Greenpeace and VXE-6 helicopters at McMurdo.

THE ANTARCTIC TREATY:

Seven nations -- Britain, France, Norway, Australia, New Zealand, Argentina and Chile -- have established claims on various portions of the continent. The British, Argentinian and Chilean claims overlap on the Antarctic Peninsula, the small part of the continent that normally remains ice-free. The United States has a potentially huge claim to Antarctic territory based on photoreconnaissance surveys and exploration, but, as Dr. Paul told Mr. Schuster, it is not pressed. The scientists who developed the IGY simply bypassed questions of national sovereignty by declaring that no scientific station had any political significance attached to it. Still, all claimant states maintain stations

somewhere within the limits of their territorial claim. Dr. Paul told Mr. Hughes the South Pole station is there to show the U.S. will refuse to recognize other national claims.

The success of scientific cooperation in the IGY, to the extent that Soviet scientists could freely interact with their Western counterparts at the height of the Cold War, led to the fundamental concepts embodied in the Antarctic Treaty of 1959. Foremost was suspension of all territorial claims while the Treaty is in force. No nation can use its activities in Antarctica as the basis for advancing a claim to sovereignty. Second was the principle of open access to all facilities on the continent and free exchange of scientific information. Third, no military activities were allowed and military personnel are restricted to those providing logistical support to the scientists.

The Treaty is enforced by the Consultative Parties, those nations who pledge to uphold the principles embodied in the Treaty and conduct "significant scientific research" on the Continent. Twenty-five countries had achieved Consultative status as of October 1989. The Treaty provided for a review of its status 30 years after its entry into force; Consultative Parties may request that review starting June 23, 1991. It is a demonstration of the success of the Treaty that at the height of the 1982 Falklands campaign British and Argentinian scientists continued to work together in Antarctica.

Dr. Paul told Mr. Schuster that geophysical data collected by some nations was not shared as required by the Treaty. He also indicated that the growing dispute over Antarctic environmental protection was straining the consensual enforcement mechanism. However, the U.S. would resist the suggested alternative: application of the "common heritage of mankind" principle expressed in the Law of the Sea treaty.

THE CONVENTION ON THE REGULATION OF ANTARCTIC MINERAL RESOURCE ACTIVITIES:

The Antarctic Treaty is supported by a set of subsidiary conventions reflecting areas of specific concern. These include the Agreed Measures for the Conservation of Antarctic Fauna and Flora (1964), the Convention for the Conservation of Antarctic Seals (1972) and the Convention on the Conservation of Antarctic Marine Living Resources (1980). The Agreed Measures require all parties to the Treaty to establish procedures protecting habitats of special scientific interest and the plants and animals in those habitats. The Conventions were established to prevent uncontrolled exploitation of the Antarctic seals and the small crustacean krill at the point where the Treaty nations could foresee significant pressure on these particular species.

Low-level concern about the effect of mineral exploitation in the Antarctic environment has existed for some time; the discovery of hydrocarbon traces in drilling cores from the Ross Sea seemed to show that oil might be found in the offshore regions of the continent. However, there is little evidence of any commercially exploitable supply of minerals or oil. Dr. Paul told Mr. Schuster he believes offshore oil platforms are at least 30 to 40 years in the future, but that an Ohio State researcher has indicated small strip mines for diamonds or gold might be feasible.

Nevertheless, the Antarctic Treaty nations, following precedent, adopted a voluntary ban on mineral exploitation and began the process of negotiating a new Convention on the Regulation of Antarctic Mineral Resource Activities in 1981 under the stewardship of New Zealand. The Convention was accepted in 1988, and the United States signed November 30, 1988. Since then, the path to ratification of the Convention has been anything but smooth.

Opposition arose immediately from those who believed the existence of the Convention paved the way for mining and oil drilling on the continent. The Greenpeace organization began campaigning for the establishment of Antarctica as a "World Park;" ironically, a concept first proposed by New Zealand in 1975. Under the terms of the Convention, it cannot be ratified without the consent of all states making territorial claims. Australia and France were the first to turn down the Convention. In March 1990, New Zealand's Prime Minister Geoffrey Palmer announced that his government "set aside for the moment the question of ratification."

According to Dr. Paul, U.S. policy has been to avoid "roping off" Antarctica. The U.S. continues to support ratification of the Convention. Under the Treaty, each party is responsible for the actions of its citizens and if one party does not establish limits on mining activities due to the lack of the convention, then unregulated mining or oil production might occur. The dispute over these two views of the Convention broke into the open at the fifteenth meeting of the Consultative Parties last year in Paris. In a compromise, the Parties agreed to a special meeting on the Antarctic environment, to be held November 19-December 7 in Santiago, Chile. Dr. Paul stated the U.S. would support an indefinite mining ban at the Santiago meeting.

Congressional views on this issue are expressed in Senate Joint Resolution 206 which states that Antarctica is a "global ecological commons." Negotiations for a comprehensive environmental protection plan are called for, with indefinite suspension of commercial minerals development. The resolution calls on United States delegation to the Santiago meeting to fully support this position. Until these new negotiations are completed, the present Convention should not be submitted to the Senate for ratification, and the United States should continue to apply the voluntary restraint on mineral activity now in force.

Congress also passed H.R. 3977, limiting U.S. citizens from pursuing mining or other extractive activities in the Antarctic Treaty area. The bill provides the legislative foundation for implementation of the principle of an indefinite ban on mineral activities as expressed in Senate Joint Resolution 206. President Bush signed both the resolution and the bill on November 16, 1990.

ENVIRONMENTAL PROTECTION AT RESEARCH FACILITIES:

Of late, a major issue in Antarctica revolves around the impact that scientific research facilities are having on the environment. At the same time Antarctica's value as a baseline for measuring human alteration to the global environment is being recognized, it has become apparent that the logistics pipeline for the scientists carrying out research on the continent is interfering with this research. A new Code of Conduct for waste

disposal activities was agreed to at the Paris meeting of the Consultative Parties. This Code encourages the Treaty partners to remove more of their solid wastes (New Zealand has a policy of removing almost all of its wastes from the Antarctic Treaty area), eliminate landfilling and open burning, and reduce the level of hazardous waste brought into the Antarctic zone.

Concerns were heightened in 1989 when the Argentine supply ship, *Bahia Paraiso*, ran aground as it approached the American Palmer Station. The ship spilled a large volume of diesel and aviation fuel into the waters around the station. Spill response was organized by U.S. and Chilean teams, but the lack of immediately available equipment and the distances involved hampered effectiveness. Dr. Paul told Mr. Volkmer that the spill affected 20 years of baseline research at Palmer Station but the effects on the penguin population seemed to be minimal. Later spills have been noted from British and Peruvian supply ships, and fuel depots at the US South Pole Station and the airfield at McMurdo Sound.

The National Science Foundation (NSF) has been criticized for its management of waste disposal in the past two years. NSF's 1990 budget request for the Antarctic Program sought $10 million to begin the Safety, Environmental and Health Initiative. This 5-year program envisions a total of $30 million to address major problems in waste management on the continent and to begin remedial work at bases and field sites abandoned in earlier years. The initiative received $8.3 million in FY1990 funds. For FY1991, the Foundation requested and received $5.7 million for environmental activities under the initiative. As an example of actions carried out under this program, the United States and New Zealand have been collaborating on the cleanup of the closed Hallett Station.

NEW ZEALAND'S ANTARCTIC PROGRAM:

Mr. Logan gave the Members a short description of New Zealand's Antarctic program. New Zealand has two major interests: geology and climate. Antarctica and New Zealand were once part of the great supercontinent Gondwanaland and New Zealand geologists and biologists need to understand Antarctica in order to understand their own country. The strong influence of Antarctica on global climate is felt first in New Zealand.

Coordination is carried out by exchanges between individual scientists, on program to program levels and by the Scientific Committee on Antarctic Research, under the auspices of the International Council on Scientific Unions. New Zealand also participates in information exchanges under the Antarctic Treaty.

Responding to Mr. Volkmer's question, Mr. Logan stated that the New Zealand program maintained one year-round base at Scott Station near McMurdo. The base supports all inland operations. New Zealand's annual budget of $8 million mostly supports long-term observational programs.

The U.S., New Zealand and Italy are now cooperating in Christchurch, taking advantage of its ports and good supply support. A tangible sign of this cooperation is the

developing multinational airlift. The U.S. program would be receiving increasing support from the Royal New Zealand Air Force.

THE INTERNATIONAL ANTARCTIC CENTER:

In the day's final briefing, Mr. Bellew carried on Mr. Logan's final point. The vast distances that separate Antarctica from the rest of the world require national programs to establish forward support bases. Christchurch has filled that role since the days of the great British explorer James Cook.

The U.S. Antarctic Program is now part of the new International Antarctic Center at Christchurch International Airport. This facility offers maintenance support for aircraft and helicopters, a port, storage, supplies and communication. The Center was proposed by Peter Wilkniss of NSF and constructed by the private concern that now operates Christchurch Airport. Stage 1, the logistics and terminal facilities, are now completed and occupied by the New Zealand, Italian and U.S. programs. Bellew hopes the Center will become the location for Antarctic databases and that scientists will come to the facility to reduce their raw data for publication. The Center's long-term goal is to become a primary center for international Antarctic research. This will be fostered by greater cooperation with New Zealand's universities.

Bellew indicated that the U.S. Antarctic Program has a significant impact in New Zealand. It contributes to the "incredible" public interest in Antarctic activities. The Center hopes to tap that interest with a "themed attraction" that will highlight Antarctic issues for the public.

Members completed this oversight visit with tours of the supply facility and passenger terminal at the Center.

MEETING: Australian Space Officials
Cairns, Australia

DATE: November 13, 1990

KEY OFFICIALS: Dr. Bruce Middleton
Executive Director, Australian Space Office

Mr. Gordon Galt
Executive Director, Cape York Space Agency

Mr. J. Donald Mirth
Senior Vice President for Advanced Engineering
and Technology Developent
United Technologies Corporation/USBI Co.

BACKGROUND:

The Cape York peninsula is located along the northern coast of Australia at a latitude of 12 degrees degrees South. Because of its proximity to the Equator, less energy is required to launch a satellite into orbit and launch vehicles can therefore launch larger payloads. In the early 1970's, Cape York was strongly considered by the newly emerging European Space Agency as its primary launch site. Australia eventually declined to join ESA and launch facilities were subsequently established in Kourou, French Guiana.

Beginning in 1986, in response to the perceived global lack of space launch capacity, the State of Queensland (and later the Australian Government) began to assess the establishment of a launch complex at Cape York. Two private consortia offered concept proposals which asserted that such an undertaking could achieve market entry while providing a cash flow to service the capital investment. Both concepts involved a "turnkey" approach in which a full service would be provided. That is, a satellite owner would deal with a single entity who would provide the launch facility, a standard launch vehicle, and all integration services.

The competing groups included the Australian Spaceport Group which envisioned using decommissioned Titan II vehicles, and the Cape York Space Agency (CYSA) which envisioned buying and using Soviet Zenit vehicles. (Although the CSYA initially considered using the Soviet Proton launch vehicle which uses corrosive fuels, the environmental effects on the Great Barrier Reef that would result from a launch failure were considered unacceptable.)

By May, 1989, it became clear that the Australian Spaceport Group concept would not yield an acceptable return on investment, while, under certain pricing conditions, the Cape York Space Agency concept could be commercially viable. The Australian Spaceport Group withdrew and disbanded.

Generally, the Cape York project has been viewed as a symbol of Australia's effort to become more technologically competitive and as a benefit to its balance of trade. Internally, it would also be of great help in the economic development of the

Queensland region.

ROLE OF THE CAPE YORK SPACE AGENCY:

Cape York offers many distinct advantages by virtue of its geography. Because most of the commercial satellites that comprise the market must be placed in a geosynchronous orbit around the equator, the closer to the equator that the launch takes place, the less energy is needed. Relative the U.S. or Chinese launch sites, Cape York offers a 15% increase in efficiency which directly translates into revenues through larger or longer lived satellites. Cape York also possesses clear launch azimuths to the east, favorable weather conditions, and a very stable political setting.

At the present time several substantial problems must be overcome in order to make Cape York a reality. A thorough environmental study must be carried out in order to assess the effects of launch operations on the surrounding area including the ecologically sensitive Great Barrier Reef. In addition, the Aboriginal population has claimed a historical possession of the land and does not wish to be dislocated. Finally CYSA must secure adequate financial backing at a favorable cost of capital.

CYSA intends to begin commercial operations in early 1995 and hopes to begin construction as early as 1992 when Governmental approval is planned. The Governmental approval will be based upon the acceptance of an environmental impact statement. The Environmental Impact Statement will take 18 months. At about 9 months into the study, CSYA intends to finalize and present to the Government of Australia market studies. About one year later, CSYA intends to have the financing in place and at that point they will begin soliciting payloads.

Financially, the Cape York Space Agency consortium is an Australian controlled company. This company is wholly owned by another Australian company, Essington Development Ltd. Essington has indicated that it will seek foreign shareholding that may include U.S., Japanese, and other interests. Overall the goal is to acquire one third capital from Australian sources and the remaining two thirds from foreign sources. However, the Australian Government has recently sought interest by other potential consortia in order to provide a more stable financial basis for the project which includes a high percentage of Australian interest. On October 17 the Department of Industry, Technology and Commerce issued an invitation for new bidders for the Cape York project.

ROLE OF THE AUSTRALIAN GOVERNMENT:

The Australian Government holds no equity in the project but there is clear endorsement and support. The Government has provided about $7.5 million thus far to carry out studies related to the project. In addition, in 1988 the Australian Government informally interceded to request expedited consideration by the U.S. of the application by Martin Marietta for the approval of a Technical Assistance Agreement for the potential role of the refurbished Titan II vehicle. In 1989, the Australian Government expressed strong support for a Technical Assistance Agreement application by United Technologies Inc. to supply management and integration services.

The Australian government has indicated that it would not provide public funds for the construction of the facility and it has not committed to any funds for the development of the surrounding infrastructure (roads, sewers, etc.) which could cost up to $600 million dollars.

Although the Australian Government has had a historical commitment to satellite based services in communications and remote sensing, it has not developed a substantial space infrastructure. Over the past five years, however the Australian Government began to develop a more aggressive space effort which included ground support of satellite operations and space la'unch services. Thus Cape York is an integral part of an Australian national plan to increase investments in space and to develop a space industry. Benefits to the Australian Government include increased gross national product, increased employment, and offsets to the balance of trade.

The Australian Space Office (ASO) is part of the Department of Industry, Technology, and Commerce. The Honorable Senator John Button, senior Senator in the Australian Parliament, is Minister for Industry, Technology and Commerce and oversees the Department.

The ASO was established in 1986 as a non-statutory coordinating body for space activities and provides an executive secretariat for the Australian Space Board. The Board is an independent body advising the Government on the national space program budget and policy issues. The ASO also coordinates its activities with other private and quasi-private space orginizations such as the Cape York Space Agency and AUSSAT.

The total Australian space budget, which is shared by several departments, is approximately $20 million Australian (about $16 million U.S.). The Australian Space Office directly administers grants of about $6 million Australian ($4.8 million U.S.).

The ASO oversees several space facilities as a part of its responsibilities. It operates the Tidbinbella Deep Space Communications Complex on a reimbursable basis as part of the NASA Deep Space Network. It also operates a Landsat data receiving station in Alice Springs and a Landsat data processing center in Canberra. Finally, the ASO operates a Balloon Launching Station in Alice Springs on a reimbursable basis with NASA. The ASO is also in the process of reactivating its launch site at Woomera in southern Australia for scientific sounding rocket observations.

The Australian Government and the ASO have several notable cooperative activities with NASA ranging from Shuttle life science experiments to astronomical observations which take advantage of Australia's southern location. A summary of cooperative activities follows:

AUSSAT

Over the past three years, events in Australia have stimulated major space policy decisions in the U.S. and in Europe. Through the Cape York proposal and the decision to use the Chinese Long March vehicle for the launch of two AUSSAT satellites, Australia has been instrumental in focusing others on possible future trends that may dramatically restructure space markets and notions of international competition. These events have largely been brought about by private organizations such as the Cape York

Space Agency and quasi private organizations such as AUSSAT which are primarily oriented towards commercial objectives.

AUSSAT Pty. Ltd. is established under Australian law to hold a monopoly on the provision of satellite facilities for domestic telecommunications traffic. Two other telecommunications monopolies are held by Telecom for the provision of terrestrial switched networks for domestic traffic, and the Overseas Telecommunications Corp. for international traffic. The Company was incorporated in 1981 and is owned 75% by the Commonwealth of Australia and 25% by the Australian Telecommunications Commission. Currently AUSSAT is burdened with excessive debt and is operating at an annual loss of 20%.

AUSSAT was intended to provide a telecommunications system for Australia and neighboring regions by the use of space satellites. Currently AUSSAT's satellite network (called AUSSAT A) consists of three operating satellites all built by Hughes, two launched by the Space Shuttle in 1985 and the third launched by Ariane in 1987. AUSSAT also operates a network of some 60 Earth stations. A further 15,000 customer owned Earth stations operate through the AUSSAT system in Australia. Telecommunications services are provided by AUSSAT to the broadcasting, aviation, finance, mining, press and other industries. Such industries typically rely on the ability of satellite telecommunications to provide networking and remote area applications more economically than terrestrial systems.

Currently the Australian communications industry is undergoing a period of deregulation and divestiture. In September, the Government decided to merge Telecom and the Overseas Telecommunications Corp. The decision to fully privatize AUSSAT is also expected shortly.

In 1988, AUSSAT held a competition for the follow on satellite system to its current constellation which is expected to become non functional in 1992 or 1993. AUSSAT departed from the normal contracting practice and asked the satellite manufacturers to also assume responsibility for the launch and procurement of the launch vehicle as a part of its bid. To ensure that national policies did not artificially fix the costs, AUSSAT required that each satellite bidder submit bids that would include several potential launch vehicles including the Chinese Long March.

AUSSAT eventually selected Hughes for the procurement using the Long March vehicle. Hughes therefore was required to submit an application for an export license to the Peoples Republic of China. In order to approve this export the U.S. considered technology transfer issues and also broader trade issues specially related to the launch industry. The Long March launch contract has been reported to be about $30 million per launch. Comparable launch costs on a U.S. vehicle would be about $80-100 million.

The U.S. decided to give overall approval for the export of U.S. satellites to the Peoples Republic of China if certain technology transfer safeguards were met and if the Chinese would agree to launch no more than 9 Western satellites over the next 6 years (ending in 1994) with no more than 3 in any one year and to price its vehicles on a par with Western vehicles.

Implicit in the decision to allow such satellite exports was the belief that relations with the Chinese were of the utmost importance and that the climate of cultural development of China was very favorable. Since that time, as a result of the suppression of human rights there, several legislative initiatives have been introduced which would affect the export of the Hughes satellites and hence the ability of the Australians to provide continuous communications services.

Current law, however allows the exports to take place if the President certifies that it is in the National interest. Although the substance of this law is worded differently in various pieces of legislation (for example the pending Export Facilitation Act), it basically provides discretionary authority to the President to use this export issue for broader foreign policy purposes.

At present, Hughes has approval for the exports but the license expires in March 1991 and must be renewed. Satellite shimpments are targeted for December 1991 and March 1992. The Administration intends to issue the Presidential certification of National interest for the AUSSAT satellites as well as other exports to the Peoples Republic of China at a later date.

ROLE OF THE U.S. GOVERNMENT:

U.S. involvement has largely hinged on export laws and policies but issues of larger concern regarding the competitiveness of the U.S. launch industry have dominated the debate and decisionmaking.

Current U.S. policy codified in the International Traffic in Arms Regulations prohibits the export of high technology items such as satellites and launch vehicle technologies that would lead to technology transfer to the Soviet Union. From a narrow perspective, the issue confronting U.S. involvement is whether the export of satellites to Cape York for launch on a Soviet vehicle or the provision of launch support services would be prohibited by this policy. The broader issue is whether the U.S. should contribute, by either action or inaction, to the establishment of a space launch capability that could have the effect of driving U.S. launch providers out of business by virtue of non-market pricing.

On one hand, restrictive actions on the part of the U.S., especially the prohibition of satellite exports, could result in the loss of the most successful segment of the commercial space industry, the satellite market. The U.S. communications satellite industry is expected to supply over 60% of the worlds satellites and lead to an excess of $2.5 billion in export revenues over the next five years. Unilaterally denying U.S. satellite manufacturers access to Cape York could guarantee a loss in market competitiveness.

On the other hand, the promotion of the U.S. launch industry is a strongly held and very deliberate policy by both Congress and the Administration. Permissive actions that would allow non-market priced launch services to close U.S. providers out of the market would not only lead to the loss of this commercial segment, in the long run it may lead to an over dependence on foreign launch capabilities. This could also force U.S. satellite providers into a non-competitive position if launching states choose to offer package satellite/launch bids.

These issues were brought into sharp focus in early 1990 when U.S. Booster Inc. (USBI) of United Technologies Corporation applied for a Technology Assistance Agreement to provide support services to the Cape York Space Agency which would include, among other activities, the role of project manager and a direct technical involvement with the Soviet launch vehicle. Although German, French, and other firms clearly have the capability to provide the needed services, the CSYA solicited U.S. commercial involvement due to the perception that the bulk of the satellite market will also be U.S.

As a result of inter-agency conflicts that resulted from consideration of this request, and also the inclusion of a special provision in P.L. 101-328, the National Space Council Authorization Act of 1990, the Space Council undertook a policy review of the launch industry and the posture of the U.S. toward non-market launch providers.

This review resulted in a policy statement in September 1990. The policy statement called for certain technology transfer restrictions to be imposed including the segregation of Soviet technicians from U.S. satellite hardware. One other crucial implementing action was to **"seek to limit the use of Soviet launch vehicles , launch equipment, technology or training to a single mutually agreed upon location outside the Soviet Union. The USSR would thereby agree to forego commercial launches of Western satellites from the Soviet Union."**

In addition, the U.S. has proceeded on the basis that negotiations must first be concluded with the Europeans on "Rules of the Road" for subsidizing private launch ventures prior to reaching final agreement with the Soviets. Thus the U.S. approach has been to negotiate a trade related agreement with the Europeans and a technology transfer related agreement with the Soviets as a prerequisite to allowing U.S. commercial participation at Cape York. At present the Technology Assistance Agreement being sought by USBI is still awaiting approval which will not be granted until negotiations with the Europeans and Soviets are concluded. At a later stage, it is the intent of the U.S. to negotiate direct trade rules of road with the Soviets when the Cape York project nears completion.

Following the completion of the feasibility study for which the Technical Assistance Agreement will be needed, the full developmental phase will necessitate a fuller involvement by USBI. At that stage, Congress must be notified pursuant to section 36 (c) of the Arms Export Control Act for the export of defense services sold commercially under a contract in the amount of $50,000,000 or more. This notification may initiate further debate within Congress.

ROLE OF THE SOVIET GOVERNMENT:

The decision of the White House to conduct negotiations directly with the Soviet Government at a diplomatic level has focused attention on a new set of considerations. The Soviets have expressed concern over two aspects of the Presidential policy.

First, the stipulation that Soviet launch capability be limited to only one non-Soviet location precludes the Soviets from marketing the Zenit, Proton or other vehicles to a broader customer base and from establishing site in Alcantara, Brazil. The effect of this provision would force general compliance with the Missile Control Technology

Regime to which the Soviets are not signatories.

Second, the stipulation that the Soviets relinquish any rights to launch Western satellites from the Soviet Union would deny the Soviets independent access to a large revenue source at a time when it is likely the COCOM and U.S. regulatory restrictions on satellite exports will be eased. Generally, the Soviets contend that these two provisions infringe on Soviet sovereignty.

DISCUSSION:

The discussion was initiated by Mr. Galt who pointed out that the entire population of the Cape York penninsula was about 10,000 people and that the environmental effects of the launch facility would be minimal. He also emphasized that the Zenit launch vehicle had had 22 successful flights with one failure.

The construction of a launch facility at Cape York would, he said, require the building of a town for about 700 people, a 3,000 M runway for 747 type aircraft, and a water supply. It would provide 3-4,000 jobs and would increase the GDP by $300M per year. In addition it would enhance technical training and retention of job skills.

Dr. Middleton pointed out that Australia does not need a launch site for the Australian space program but would view it in a much broader context. Economic assessments show that Cape York would not be viable as a facility only but must include vehicle and launch services as well. Dr. Middleton pointed out that Australia would have difficulty with "rules of the road" that levied China like quotas on the Cape York activity. He stated that the U.S. is not to be set out as an appropriate surrogate market for the purpose of establishing pricing standards. He stressed the need for multilateral negotiations in order to develop mutually acceptable agreements.

Mr. Mirth stated that Congress would become more deeply involved when the phase 4 development of the Cape York facility would require notification under the Arms Export Control Act. Mr. Mirth stressed that in such debates that consideration be given to the terms of the offset credit opportunities which retain jobs in the U.S. He also said that technology transfer considerations could only be properly addressed when the Technology Assistance Agreement was approved and USBI is given the opportunity to be involved in the ongoing negotiations.

Chairman Roe pointed out that the purpose of the Committee's visit was to listen and to develop a sufficient understanding of issues and background for Cape York that an informed decision could be made. The U.S. passed the Commercial Space Launch Act to move away from Government control of the space lauch industry. However, as a practical matter, there is a limitation on the number of payloads available for competition by private lauch entities. The question then is, which direction should we go and how should the global industry evolve? These issues are of utmost importance also because the U.S. is a major leader in the satellite industry and we cannot afford to bury our heads in the sand. The ultimate outcome, he said, would be contingent on negotiations with the Soviets, ESA, the Australians, and others.

Discussion also centered on the extent of Japanese involvement and the possibility that Cape York would become a major facility for Japanese launches in the future. This was strongly discounted by the Australian authorities.

MEETING: Cape York Spaceport
Cape York, Australia

DATE: November 14, 1990

KEY OFFICIALS: Dr. Bruce Middleton
Executive Director, Australian Space Office

Mr. Gordon Galt
Executive Director, Cape York Space Agency

Mr. J. Donald Mirth
Senior Vice President for Advanced Engineering
and Technology Developent
United Technologies Corporation/USBI Co.

TOUR:

The Committee was provided an on site tour of the future Cape York launch facility. The spaceport will be located on the east coast of the Cape York peninsula on Bromley Holding at a latitude of 12 degrees south. The Bromley Holding has an area of 155,000 Ha which is intended to be adequate to develop the space port and ensure safe operation of launch vehicles.

The launch complex together with its technical support facilities will require an area of less than 300 Ha. Large areas will be set aside to act as a safety buffer zone to avoid danger to persons or property. These areas will also be managed as environmental conservation areas as have areas around Kennedy Space Center where substantial increases in protected species of flora and fauna have been reported.

The spaceport location is remote and is currently unserviced. Sea and air services will be established during the development of the spaceport. An airfield will be built in proximity to the spaceport for personnel movement and to handle cargoes such as satellites and other sensitive or perishable supplies. Larger cargoes will be received initially in deepwater ports of Cairns or Townsville and transhipped by barge to the spaceport. A barge ramp will be constructed at a suitable coastal location.

Other supporting infrastructure elements include a town for an estimated population of 700 persons. This will also include roads, a power station, water supply, sewage treatment, and waste disposal.

Launch facilities consist of two main elements, the assembly and testing complex and the launch complex. Major buildings for the assembly and testing complex include the vehicle assembly building, vehicle storage building, transporter/erector, and environmental control system. The launch complex will include a launch pad, service tower, launch control center, propellant storage facilities, and gas storage facilities. In addition, range support facilities will include radar, telemetry, a range control center, a communications center and warehousing.

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The Committee gained a firsthand understanding of the terrain and general layout of the intended launch complex. Although the existing area is undeveloped and rugged, CSYA personnel pointed out that it is no more so than the areas on which Cape Kennedy and Vandenberg were constructed.

ENVIRONMENTAL IMPACT OF SPACE OPERATIONS

One issue of major concern for the Cape York project relates to its environmental impact. Although the National Environmental Policy Act was not in place at the time the Kennedy Space Center was built, environmental concerns were always a major consideration. Since the establishment of KSC, three major Environmental Impact Statements have been developed.

Despite early attempts to settle on Merritt Island, the marsh land that now constitutes KSC, mosquitoes and forbidding conditions kept the island largely undeveloped until the early 1960s when NASA began acquiring the land for space launch purposes.

In 1963, when acquisition was complete, NASA turned over those portions of the Center not critical to the space program to the U.S. Fish and Wildlife Service. Thus the 220 square mile Merritt Island National Wildlife Refuge was established. Since then the U.S. space program has coexisted with one of the rarest wildlife habitat areas in the world.

A wide variety of habitats exist on the reserve ranging from fresh water impoundments and vast salt water estuaries to brackish marshes. This diverse landscape provides a home for more than 310 species of birds, 25 mammals, 117 fishes and 65 amphibians and reptiles. It also provides wintering areas for 23 species of migratory birds.

Currently, the refuge supports 22 wildlife species listed as Endangered or Threatened, more than any other single refuge in the U.S. These range anywhere from the Southern Bald Eagle which has a population of only 15 to the Gopher Tortoise that has a population of over 13,000. The delicate food chain that supports these valuable species has been preserved over the 35 year history of the space program.

Prior to each Shuttle launch an Environmental Evaluation Console is manned to monitor environmental effects. Complex rocket exhaust plume computer models are run and wind conditions are carefully monitored. Extensive post launch field surveys are conducted after every launch.

In 1971 NASA completed a comprehensive Institutional Environmental Impact Statement in order to establish an environmental baseline against which all future launch operations could be compared. The document included an description of the environmental effects associated with facilities then in existence together with potential effects anticipated from ongoing activities.

In 1973 that EIS was redone in order to describe the environmental effects predicted from the Space Shuttle including additional construction activities.

Finally, in 1979, that EIS was once again revised to incorporate changes and additions to the facility and operational concepts established during the final stages of the development of the Space Shuttle program. This represents a comprehensive overview of the environmental effects of the space program at KSC. The environmental baseline is now monitored continuously and all environmental effects are documented in an Environmental Resource Document.

It can be said with confidence that the presence of the Kennedy Space Center has not only had a negligible impact on the local environment, the extensive efforts to maintain the associated wildlife refuge have improved the environment.

MEETING: Australian Institute of Marine Science
Townsville, Australia

DATE: November 15, 1990

KEY OFFICIALS: Dr. Joe Baker, Director

BACKGROUND:

The Australian Institute of Marine Science (AIMS) was founded in 1972 under the Department of Industry, Technology, and Commerce, and since 1977 has been based at its Cape Ferguson headquarters (50 km SE of Townsville on the shores of Turtle Bay, bordered by National Park and the waters of the Great Barrier Reef Marine Park). Cape Ferguson was selcted because of the proximity to clean sea water and to the national park environment. The Great Barrier Reef is considered Australia's greatest national treasure. Stunning coral reef formations and marine life species extend 2,300 km from Australia's Torres Strait border with Papua New Guinea south to a point off central Queensland. As pollution and tourism pressures have increasingly threatened the beauty and ecological value of the Reef, the importance of AIMS in documenting and understanding this unique environment has increased.

Dr. Baker, the Director of AIMS, is a biochemist with interests in marine natural products.

The Institute complex comprises eight research laboratories, central library area, computer center, offices, workshops, a series of cold rooms and constant temperature rooms, marine operations center, mariculture facility, and residences for as many as forty visiting scientists. At present, there is a staff of 105, but the actual number of persons on site can be up to 170. AIMS staff collaborate with scientists in 19 countries -- interaction occurs with more than 40 scientists in the United States alone. Collaborative international research projects have been conducted under the auspices of ASEAN, UNESCO, and IOC.

The main geographic areas of research are the coastal and continental shelf regions of tropical Australia. AIMS's charter provides for conducting deep or "blue" water oceanography only under circumstances where there is a relationship of importance between the deep sea and the continental shelf, and then usually in collaboration with other national agencies.

AIMS's research efforts have won international acclaim, particularly in the fields of mangrove, coastal systems, and coral reef research. Its research program is conducted within four major program areas:

Coastal Processes and Resources aims to develop an integrated understanding of the physical and biological factors affecting the present or potential resources of the coastal zone, with particular emphasis on mangrove forests and significant river systems. Work has been conducted throughout the Pacific Rim, Thailand, and Indonesia.

Reef Studies are concerned with developing an understanding of the varied and integrated roles of animals, plants, and environmental factors in determining how and why reefs exist as they do now, as well as to increase understanding of the variations

in reef composition, mechanisms, and processes over time scales from seasons to centuries.

Environmental Studies and Biotechnology has three objectives: first, to develop an understanding of the manner in which selected marine organisms respond to and record environmental conditions, thus contributing to understanding of climatic processes and other important environmental processes; secondly, to develop an understanding of the manner in which biological solutions can be applied to human requirements; and thirdly, to develop an understanding of the genetics and associated environmental aspects of selected marine organisms related to their commercial mariculture. Climate related research from corals provides uitque information whicfi compelemtns national and international studies of the world climate. The search for bioactive substances from marine organisms is relevant to the pharmaceutical industry, while mariculture research is targeted to benefit the developing prawn mariculture industry of Australia.

Marine Systems Analysis and Oceanography aims to develop an understanding of the system dynamics of tropical Australia's continental shelf regions. Applications include environmental monitoring and management of wastes and effluents, palnning of coastal and island developments, the provision of operational data for fisheries, mapping and survey, and national park management purposes, as well as the operational design and monitoring of mariculture installations.

After a decade of research focused on pure science, AIMS is now becoming increasingly involved in the application of its research to community needs. Research on biomedicinals derived from marine organisms, aquaculture genetics, and development of sun screen compounds from corals are examples. From a management perspective, the increased interest in applications is also reflected in the fact that AIMS is now required to raise thirty percent of its operating revenues from non-Federal sources.

DISCUSSION:

The delegation broke into small groups and spent the morning in discussions with AIMS scientists working on eleven individual projects:

1. Coral Evolution (Dr. John Pandolfi). The findings have particular importance to the impact of any sea-level rises that may occur as a result of global warming.

2. Crown-of-Thorns Starfish Study (Dr. Peter Moran). This study of a devastating coral predator includes significant U.S. collaboration.

3. Sediment Transport Studies in the Gulf of Papua (Dr. Eric Wolanski). These studies are particularly relevant to the impact of coastal mining operations.

4. Sunscreens from Corals and Other Marine Organisms (Dr. Walter Dunlap). Partially funded by NSF, this work has led to patented products.

5. Prawn Mariculture (Dr. John Benzie). AIMS work is focussed on genetics and the breeding of stud prawns.

6. Mangroves and Fisheries (Dr. Alistar Robertson). Work has focussed on the significance of mangroves in biological productivity and on the movement and growth rates of baitfish.

7. Weather Records in Long-Lived Corals (Dr. Peter Isdale). Studies are relevant to the understanding of the tropical impact of past climate changes.

8. Specialized In-House Equipment (Mr. George MacNaughton).

9. Underwater Video Surveys of Coral Reefs (Dr. Terry Done). Techniques with wide applications in monitoring change of coral reef ecosystems.

10. Remote Sensing and Oceanography (Dr. Derek Burrage). This work involves the use of remote sensing to study the exchange of both riverine and oceanographic waters with Reef waters. The group uses NOAA and NASA satellites and will participate in the TOPEX project.

11. Anti-Cancer Research (Dr. Peter Murphy). As part of a larger project funded by the NIH to treat cancer and AIDS, this project will provide 5,000 species of marine invertebrates for screening in the NCI innovative, anti-tumor and anti-HIV bioassays.

Following these meetings, delegation Members discussed U.S./Australian cooperation in marine science with Dr. Baker and with three members of the AIMS Council (Dr. Ray Steedman, Chairman; Prof. Peter Andrews; and Prof. Nancy Millis).

MEETING: Division of Radiophysics, Commonwealth Science and Industrial Research Organisation
Sydney, Australia

DATE: November 16, 1990

KEY OFFICIALS: Dr. Dennis Cooper, Chief of the Division of Radiophysics

Dr. R.D. (Ron) Ekers, Foundation Director of the Australia Telescope National Facility

BACKGROUND:

Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO), as a whole, is one of the largest national research institutions in the world. It maintains an average staff of 7,000 (some 2,000 scientists) in about 100 laboratories and field stations located all over Australia. The Division of Radiophysics, part of the Institute of Information and Communications Technologies, presently employs 139 professionals, of which 55 form the scientific core.

CSIRO embodies features that in the United States are diffused through a number of collaborating institutions. It contributes to standards development like the National Institute of Standards and Technology, carries on research like U.S. mission agencies, and performs much of the basic research the U.S. government supports in universities. For much of its history, CSIRO has been the lodestar of Australian science.

Born in 1928 as the Council for Scientific and Industrial Research, CSIRO began by providing Australian agriculture the same scientific services offered U.S. farmers by the U.S. Department of Agriculture. Industrial research gained importance in 1936, with the creation of the Division of Industrial Chemistry, the National Standards Laboratory, and the Aeronautical Laboratory. The Council became the Commonwealth Scientific and Industrial Research Organization in 1949.

Since 1985, the Australian government has expressed dissatisfaction with the contribution of Australian science to economic competitiveness. CSIRO has been in the center of the storm. Australian universities have improved their capabilities in basic research, leading many to feel CSIRO should concentrate on application projects with direct economic relevance instead. The Labour Government has instituted a policy calling on industry for greater collaboration and funding, with greater technology transfer from CSIRO. To comply, the organization has adopted the following objectives:

* to carry out strategic research that can be applied by Australian industry or government for community benefit;

* to collaborate with other institutions and industry to strengthen their research efforts and to insure transfer and

application of results; and

- to lead and promote an expanded scientific and technological effort in Australia.

The Australian scientific community has responded warily, with the same argument this Committee has heard many times from its U.S. counterparts: sacrificing basic research is a losing strategy in the long term. Some tension exists between the CSIRO leadership and Government ministers. There has also been skepticism that Australian industry will fill the role envisioned for it by the government. Australia has depended on primary industries like agriculture and mining for its exports, and its manufacturing sector had focused itself to serve its home market while depending on trade barriers to prevent undercutting by imports. This strategy has not furnished significant industrial support for research. The Australian government instituted a tax credit of 150% on a company's research and development spending to overcome corporate reluctance; just how positive was the response is still debated.

CSIRO and the Australian government are asking many of the same questions this Committee has tried to answer for the Department of Energy's National Laboratories. The industries of the future require a different set of skills and priorities. For CSIRO, the questions are even more important because it embodies much more of Australia's scientific capabilities than its counterparts in the United States.

THE DIVISION AFTER CSIRO'S REORGANIZATION:

Dr. Cooper opened the meeting with a discussion of the Division's efforts to respond to the Government's expectations of CSIRO. The major change has come in the Division's funding profile. Dr. Cooper stated that the Australian government was pushing CSIRO out into the marketplace with a requirement that the Division obtain 30% of its support from non-government sources by 1993. The Division presently has a budget of approximately A$400 million. The Commonwealth Government provides $300 million, and the Division is now earning some $90 million from outside activities.

Dr. Cooper expressed some discomfort at this, stating that there is a delicate balancing act between basic and applied research. He is confident that the Division can maintain its laboratory character if its budget relies on 15% outside funding. At 30%, he characterized the Division as being in "no man's land."

In terms of cooperating with industry, CSIRO retains patent rights to new developments but negotiates intellectual property issues between its collaborators and staff. The Division finds it must go well up the product development change in its cooperative projects due to the "fractured structure" of Australia's electronics industry, according to Dr. Cooper.

THE DIVISION OF RADIOPHYSICS AND THE AUSTRALIA TELESCOPE:

Dr. Cooper noted the close association between the Division and the newly dedicated Australia Telescope, which had recently achieved independent status within the Institute

of Information and Communications Technologies.

During World War II, Australia benefited from the arrival of many British scientists who were pioneers in radar research. As a result the country is one of the leading centers of optical and radio astronomy. The Institute houses the nucleus of Australia's radio astronomy community and is now managing its newest instrument, the Australia Telescope.

Radio astronomers make important contributions to the understanding of star formation and deep-space quasars by gathering in the radio emissions from these powerful energy sources. Unfortunately, radio waves have much longer wavelengths than light waves, so to obtain equivalent pictures the radio astronomer needs a collecting surface with an area far surpassing an optical telescope. As an example, for a radio telescope collecting 5 cm. waves, the collector would need to be 160 km. in diameter to obtain an image equal to that produced by the 2.4 meter Hubble Space Telescope mirror (without aberration).

Since no single unit could be constructed along these lines radio astronomers have compensated with technology. By using more powerful computers and precise atomic clocks, signals received at smaller antennas widely spaced can be combined to achieve a radio image with a resolution equal to or better than optical telescopes. Since 1980, the premier example of such a telescope has been the Very Large Array (VLA) near Socorro, New Mexico. Dr. Ekers commenced by noting that the Australia Telescope is a VLA-class observatory that will enable scientists to obtain far better data on the galactic phenomena only visible from the Southern Hemisphere.

Costing $48.4 million, the Australia Telescope has five dishes, each 72 feet in diameter and weighing 266 tons, which sit on almost two miles of rail track near Culgoora. By September 1991, the facility expects another dish to be wired into the network, completing the Compact Array. A year later, a seventh dish, to be positioned near Coonabarabran 72 miles to the south, should be operational.

Already operational is the 64 meter dish at Parkes that, as Dr. Ekers noted, is a valuable part of NASA's Deep Space Network and provided important support to the collection of data from *Voyager 2* at Uranus and Neptune. Parkes' value increased with the collapse of the 300 foot steerable radiotelescope at the National Radio Astronomy Observatory (Green Bank, West Virginia) on November 16, 1988. By combining the Compact Array, the Coonabarabran dish, and the Parkes dish, Australia can create the equivalent of a 200-mile-wide collector in its Long Baseline Array. Collaboration is also planned with the NASA Deep Space Network dish at Tidbindilla, the Universities of Tasmania (Hobart), Sydney, Adelaide and Western Australia and the European Space Agency in Perth.

Dr. Ekers concluded that the Australians hope to link the Telescope to radio astronomy satellites like the Soviet RADIOASTRON and the proposed European-American QUASAT to create a receiver almost five times the Earth's diameter in extent. Cooperation with NASA and Japan's Institute of Space and Astronautical Sciences is already underway.

TECHNOLOGICAL CONTRIBUTIONS FROM THE DIVISION:

Dr. Cooper resumed, noting that the Division began by building radar antennas for deployment on Pacific islands during World War II, and its specialty in radio astronomy followed naturally. By the 1960's, the focus had shifted almost entirely to science, giving the Division a strong systems engineering background and experience in image processing.

The Division made its reputation in the 1970s with the development of aircraft landing systems that have evolved into the Instrument Landing Systems comm'n at U.S. airports. Collaboration with Texas Instruments and Bendix resulted in the choice of the Time Reference Scanning Beam system as a U.S. standard by the Federal Aviation Administration.

Dr. Cooper noted the Division has always had strong capabilities in antennas. This has driven a commercial relationship with Hughes for the creation of advanced antenna designs for the new Galaxy satellites. Cooper is confident this long-term relationship will continue.

Examples of other projects include geophysical imaging systems. In work on NUMBAT, a robot for use in evaluating conditions in mines after accidents, the Division is supplying both the primary fiberoptic communication and control link but also a backup system that transmits directly through the Earth. The medical imaging group is attempting to adapt its system for use in grading meat before processing.

Mr. Volkmer asked Dr. Cooper about the Division's computing resources. He responded that much of the demand came from scientists seeking to reduce data from the Australia Telescope into visual form. The Division maintained a minisupercomputer on site in Sydney and could access a Cray Y-MP supercomputer in Melbourne.

Chairman Roe engaged Dr. Cooper in a lengthy discussion relating to the Division's technology transfer activities. Given the small size of Australia's scientific community, conflicts of interest are occasionally raised but usually do not interrupt decisionmaking. CSIRO finds itself much more heavily involved in engineering and production design when collaborating with industry.

Dr. Cooper noted that international collaboration is a much more difficult prospect, and that he has initiated research with the University of Adelaide to find out just what information is necessary for scientists to work together without being physically present. Xerox's Palo Alto Research Center and the University of Michigan have a similar project underway in the United States. Dr. Cooper told the Chairman he has seen one change in the Division's emphasis on industrial collaboration. Where the network of radio astronomers once allowed the Division to track the advance of technology very easily, new networks are growing between CSIRO staff and their industrial counterparts. The tension about technology sharing is growing as basic and applied research grows closer.

MEETING: Division of Applied Physics, Commonwealth Science and Industrial Research Organisation
Lindfield, New South Wales

DATE: November 16, 1990

KEY OFFICIALS: Dr. John Collins, Assistant Director
Dr. Graeme Sloggett, Biomagnetometry Project Leader
Dr. B.F. Oreb, Optical Instrumentation Project Leader

BACKGROUND:

After visiting the Division of Radiophysics, the delegation travelled to laboratories at the Division of Applied Physics. This division is one of five making up the CSIRO Institute of Industrial Technology, which has the mission of assisting Australian industry in improving its international competitiveness. Among the Institute's other divisions: biotechnology, chemicals and polymers, manufacturing technology and materials science and technology.

Dr. Collins greeted the Members with a presentation on the Division's budget and personnel. The Division staff currently numbers 289; 134 of these are scientific and engineering professionals. Its 1990 budget was approximately A$20 million, with A$17 million appropriated by the Commonwealth government and A$4.5 million received from external sources. Dr. Collins stated that the Division is seeking greater outside funding as a result of the Government's goal to obtain thirty percent of the CSIRO budget from external sources.

Research at the Division focuses on improvements in the Australian technical base, and the staff closely cooperates with industry on improving products, manufacturing processes and measurement techniques. These projects receive two-thirds of the Division's resources. The remaining third is devoted to the establishment and maintenance of Australian national standards and associated calibration services for industry. Basic research supporting the Division's mission comprises 10-15 percent of the research program.

Like U.S. Department of Energy National Laboratories, technology transfer and commercialization are important to the success of Division activities. CSIRO's solution is the "generic industrial research grant," which establishes a cost-shared joint venture with industry. When industry is ready for commercialization, CSIRO issues a license permitting use of the technology in exchange for royalty payments. This is similar to the expanded authority Congress has granted the national laboratories for cooperative research and development agreements in the Department of Defense Authorization Act for Fiscal Year 1991.

The Division focuses on research in five program areas: electrotechnology; applied electricity and magnetism; plasmas, thin films and thermography; acoustics and mechanics; and optical technology. Division staff demonstrated projects in electrotechnology and optics for the delegation.

BIOMAGNETOMETRY:

Doctors in recent years have been given diagnostic tools allowing them to study the human body without the need for exploratory surgery. Computerized axial tomography and positron emission tomography devices use powerful signal processing technologies to improve images obtained from X-ray or brain metabolism. These images can give physicians enough information to make decisions on patient treatment.

The Division gives special attention to Australia's scientific and medical instrument manufacturers. Collaborating with the neuroscience unit at Sydney's Westmead Hospital, the biomagnetometry project is seeking to use magnetic fields generated by small electrical currents in the brain as the basis for a new visual diagnostic system. Preliminary studies indicate that while magnetic field patterns show some similarity in all people, there are individual unique characteristics.

As its major contribution, the Division is developing superconducting quantum interference devices (SQUIDs) that make use of the new high-temperature superconducting materials first identified in 1987. SQUIDs use the Josephson effect (ultrafast electronic switching at very low power levels) to create sensors capable of detecting the very low magnetic fields created in the heart and brain. Rather than employing superconductors that work only at liquid helium temperatures, the new SQUIDs under development would permit the design of diagnostic machines capable of operating in regular hospital facilities. Development of such detectors may also have antisubmarine warfare and geoscience applications.

OPTICAL PROFILING:

Collaborating with the Royal Australian Mint, the Division has developed a device capable of measuring the tools and dies needed in coinage without direct contact. The system makes a major contribution to productivity by reducing the time such equipment must spend in the Mint's metrology laboratory. The OSP-130 is capable of calibrating and measuring a tool or die in 15 minutes.

After mounting the tool or die in the OSP-130, a standard grating is projected onto the matte-finished surface. A camera then captures an image of the induced distortions in the grating. Comparing the digitized image to the standard allows the customized software to calculate the surface relief of the tool or die. This is critical if Mint personnel are to detect out-of-tolerance tools, a tool that demonstrated significant variation from the norm, or a die that is not optimized for its particular press. These items must be within specification if coins are not to be damaged in production.

The optical profiler is also valuable in research and development. Using the capability to accurately reposition tools in the OSP-130, the effects of heat-treatment and hardening on surface finish and relief can be tracked over time. Those processes which offer improvements in tool life or die accuracy can be identified and implemented.

Dr. Oreb also demonstrated that the OSP-130 has application in the measurement of prosthetic devices. This may permit the development of customized artificial limbs offering greater comfort and mobility to the disabled.

MEETING: Australian Nuclear Science and Technology Organization
Lucas Heights, Australia

DATE: November 19, 1990

KEY OFFICIALS: Dr. David J. Cook, Director

Dr. Adam Jostsons, Director, Advanced Materials

Dr. John Boldeman, Director, Applications of Nuclear Physics

Dr. Mike Costello, Director, Maralinga Relocation Project, Environmental Science Program

Dr. Wally Zuk, Director, Environmental Science

Dr. A. Ian M. Ritchie, Project Manager, Physics of the Environment

BACKGROUND:

Dr. Cook welcomed the Members with a short briefing on the history and mission of the Australian Nuclear Science and Technology Organization (ANSTO). Under the new organic act of February 1987, which revamped the Australian Atomic Energy Commission, ANSTO emphasizes research and development in relation to nuclear science and technology, production and use of radioisotopes and biomedical applications, advanced materials and environmental research.

ANSTO maintains two major reactors. HIFAR is a ten megawatt reactor used for radionuclide production, for testing high-intensity radiation effects on materials, and for neutron analysis of molecular structure and trace element concentration. It is based on a British design. The one hundred kilowatt MOATA reactor, a US Argonaut design, targets research in physical chemistry, materials and continuing studies in neutron capture therapy.

Mr. Mineta questioned Dr. Cook regarding allegations that HIFAR was suffering from safety problems as alleged by ANSTO engineers in a recent article (Robert Darroch, "How Safe is the Old Lady of Lucas Heights," *The Bulletin* (Sydney), 17 July 1990, pp. 40–46). Dr. Cook responded that the dispute was more an industrial relations problem with the engineers, who did not have opportunities for advancement. The *Bulletin* article, he said, raised allegations that had been circulating for fifteen years. HIFAR is an old design, and Cook stated he had proposed a series of solutions. The engineers, he claimed, preferred confrontation. He concluded with his hopes that revamping HIFAR would open up new career paths for the engineers and overcome the difficulties.

The Australian government, as part of its general science policy, hopes that ANSTO would raise a larger portion of its budget from private industry. Cook reported that ANSTO now has a requirement to obtain 30% of its budget (he estimated this to be A$27 million) from outside sources by 1993.

SYNROC HIGH-LEVEL NUCLEAR WASTE DISPOSAL:

Like the United States, Australia has been developing methods to assure the safe disposal of high-level nuclear wastes. The Synroc project matches the U.S. effort to immobilize high-level wastes in borosilicate glass at the Savannah River Plant Defense Waste Processing Facility and New York's West Valley plant. A similar vitrification plant will be constructed at the Hanford facility in Washington State.

According to Dr. Jostsons, the project director, the problem involves finding a material that remains stable for extremely long periods of time in the harsh environment generated by radioactive materials. The Australian project has chosen a rock-like ceramic medium whose structure is tailored to trap radioactive atoms and which can withstand attack by groundwater at elevated temperatures. ANSTO argues that their life-cycle processing costs will be lower and that the Synroc material offers better protection in case of repository accidents. Because Synroc can withstand higher temperatures, Jostsons believes a repository can be buried deeper within the Earth. Synroc was funded because it is an Australian idea and because Australia, as a major uranium supplier, felt it important to contribute to waste solutions. Jostsons now believes the problem is social, not scientific.

Australia and Japan have begun a second five-year collaborative project, and the United Kingdom, U.S.S.R. and China have recently signed cooperative agreements. Construction of the demonstration plant commenced in 1983, and pilot runs began in 1987. To date, the project has produced 5.5 tons of material. Jostsons believes Synroc is still fifteen years away from commercialization.

Dr. Jostsons told Mr. Volkmer that the Japanese had already tested Synroc with actual radioactive material in the first five-year effort. While radiation damage is higher for crystalline materials like Synroc, the material should still retain its integrity over a geological timescale. Even at a higher leach rate Synroc would be preferred. Glass, he said, has an initial advantage for storing waste now, but ANSTO hopes Synroc will be ready to handle the more difficult transuranic (TRU) wastes as they are separated from less-radioactive substances.

TANDEM ACCELERATOR:

ANSTO, said Dr. Boldeman, was seeking an accelerator to use in climate research and biomedical applications. Given the budget, however, it was unlikely that they could afford to buy one. However, when he learned that the Nuclear Physics Laboratory of Rutgers University was closing, he offered to buy their Van De Graff linear accelerator. At the time of the Committee's visit, Dr. Boldeman was supervising feverish activity aimed at installing and activating the accelerator.

Mass spectrometry will be the facility's primary program. The accelerator can measure one carbon-14 molecule among 10^{16} of the more abundant carbon-12 isotope. Thus, the accelerator will be ideal for measuring carbon abundance in air samples from the Antarctic icecap, giving some idea of the time the air was trapped. This will also be valuable in managing artesian water supplies in the State of Queensland. Dr. Boldeman also described another project using calcium-41 in studies of osteoporesis. Boldeman mentioned work by Jay Davis of Lawrence Livermore National Laboratory to breed mice whose tissues contained only carbon-12 to use in studies tracing the absorption of carcinogenic materials.

ANSTO, he said, is also working with the Royal Prince Alfred Hospital of Sydney to install the National Medical Cyclotron. This facility will be the first facility to use Positron Emission Tomography medical imaging in Australia.

MARALINGA RELOCATION PROJECT:

In the decade between 1953 and 1963, the United Kingdom conducted a series of nuclear tests on the Monte Bello islands off Australia's northwest coast, and at the Maralinga and Emu sites in the State of South Australia, south of the Great Victorian Desert and north of the Nullarbor Plain. Dr. Costello presented the findings of the Technical Assessment Group (TAG) convened by the Department of Primary Industries and Energy in 1986 to evaluate the options for cleanup of these sites. The report, a copy of which was provided to the Committee, was transmitted to Parliament on November 14, 1990.

The major problem at Maralinga, according to Costello, is plutonium deposited during the "Vixen 'B'" test series, designed to examine scenarios where aircraft carrying nuclear weapons crashed but the weapons did not detonate. The resulting contamination diffused about 22 kg. of plutonium into the ground. Maralinga is home to a nomadic Aboriginal tribe, the Tjarutja, whose major risk comes from inhalation of dust carrying plutonium-239 or americium-231 resuspended by human activities (such as children playing).

The Technical Advisory Group carried out two surveys. In 1987, anthropologists studied the daily routines of the Tjarutja, while another group checked on the bioavailability of radioactive materials. EG&G, working for the U.S. Department of Energy, performed an aerial survey to determine the extent of radioactive contamination in the area.

Costello reported that the TAG identified three separate areas needing consideration. In the area where the tests were actually conducted, the situation had been complicated by an earlier attempt (Operation Brumby, 1967) at cleanup, where the United Kingdom had plowed the plutonium under in the belief that surface contamination was the most significant danger. This had spread plutonium through a two square kilometer area that would now require scraping and rehabilitation. A second area of concern involved the ground downwind from the test site which received smaller doses of plutonium. Finally, wastes from the Vixen tests were concentrated in twenty-one pits, two of which needed early attention.

Summarizing the TAG findings, the report presented two options for dealing with contaminated soils. The area could be fenced off in perpetuity, or the soil could be removed, allowing progressive release of the land. In the area plowed during Operation Brumby, this might involve removal of 400,000 cubic meters of soil. The volume would increase if soil from downwind areas was included. To treat the waste pits, the TAG report proposes either to exhume the wastes for reburial elsewhere, or to use the *in situ* vitrification process developed by Battelle Laboratories. In all cases, the standard for cleanup and release would be a residual contamination of five milliSieverts per year.

In terms of cost, the report predicts that maintenance of the status quo would require a budget of A$13 million per year. To remove contaminated soils from the Brumby region would require six years and cost A$93 million. If the decision were made to remove all contaminated soil, the cost would increase to A$630 million over ten years.

MINE RECLAMATION:

Dr. Ritchie concluded the visit to ANSTO with a presentation on mine reclamation at the Run Jungle uranium mine. Operated between 1950 and 1960, the mine was ultimately abandoned in 1970. Left behind were a number of waste dumps 20m high and 600m wide, threatening to pollute the watershed for hundreds of years.

Heavy metals are a special concern in watersheds where mining is underway. The waste dumps at Rum Jungle were enriched in sulfites and pyrites which, when exposed to water and air, created sulfuric acid and released copper, manganese and zinc into a nearby creek. Aquatic life was destroyed. Ultimately, the mine site was rehabilitated for A$80 million between 1983 and 1986; A$4 million was required to reclaim the waste dumps.

ANSTO staff have collaborated with the Bureau of Land Management to learn about their work at the Midnight Mine site in Washington State. Canada and Sweden are also funding research in this problem. Dr. Ritchie believes the Canadians are in the forefront with a well-organized national program.

Technology transfer requires close cooperation with mine operators. International cooperation would be helpful but is limited by a lack of resources in each national program.

MEETING: Australian Country Team Briefing
Canberra, Australia

DATE: November 19, 1990

KEY OFFICIALS: Gil Lampher, Deputy Chief of Mission

BACKGROUND:

The Australian Political Scene. Robert Hawke became the first Australian Labor Party (ALP) leader to win a third consecutive term as Prime Minister after leading the ALP to an easy victory over a fractured conservative opposition in the July 1987 general election. Hawke is now the second longest serving prime minister in Australian history (after Menzies: 1939-41 and 49-66). He is a former president of the Australian Council of Trade Unions (ACTU) -- an organization equivalent to the AFL-CIO. The Australian press reports that he has received substantial support from the business community for his moderate, and at times conservative, economic policies. Hawke is widely recognized as a good friend of the United States, and he has publicly criticized former New Zealand Prime Minister David Lange for the latter's antinuclear stance. Hawke has denounced the 25 September coup in Fiji.

The March election reduced the Australian Labor Party (ALP) majority in parliament to four seats (down from 11 seats). This could increase leverage of the ALP left wing, limiting Hawke's freedom of maneuver on alliance issues; no evidence of this yet.

Closely allied to Australia's trade union movement, Hawke's government represents a complex factional balance. Over the past seven years, Hawke has overridden his party's left wing to maintain strong defense ties to the United States. The Liberal Party-National Party opposition coalition also favors strong defense ties with the United States.

Since taking office in 1983, the Labor government under Prime Minister Hawke has adopted pragmatic macroeconomic policies to liberalize and open the economy and further competitiveness. Hawke and Treasurer Keating launched a bold structural overhaul. The Australian dollar floated freely; an accord with unions restrained real wages; tariffs and import quotas were lowered, subsidies reduced, regulations cut. In April 1989 and again in 1990, Keating announced an income tax and wage plan allowing for limited real wage increases. By early 1990, tight monetary policy stemmed inflation, high consumption and imports. Monetary policy was being eased slightly to avoid a recession.

Australia ended its 1989-90 fiscal year on June 30, 1990, with a U.S. $6.4 billion government surplus, notwithstanding tax cuts which took effect a year ago, and a new, politically oriented budget offering expanded benefits to many.

With Labor's unprecedented fourth-term victory in March 1990, many were pointing to the necessity for continued microeconomic reform, especially in telecommunications, labor, and transportation markets. Monetary policy will have to be carefully structured to avoid a recession while not rekindling excessive consumption.

Bilateral Relations. United States-Australia relations are generally characterized as a full, equal partnership. The last 50 years are best characterized as a "special relationship" which is continuing. Bilateral relations are excellent, but Australian concerns over U.S. trade policies (e.g. the Export Enhancement Program (EEP) and sugar tariff quotas) have caused problems.

The US/Australian S&T Cooperative Agreement was signed on October 16, 1968, and renewed for succeeding five-year intervals in 1973, 1978, and (following two years of short-term extensions) 1985. In May 1990, the US presented the government of Australia with a proposal to amend the Science and Technology Agreement with an IPR Annex and Security Obligations language. The Australian government has been reviewing the US proposal since that time. The Agreement was extended for six months on October 16, 1990, to allow time for negotiation on IPR and Security Obligations Language. A response to the US proposal is in the final clearance stages in Australia.

BRIEFING

Security Relations. Australia contributes significantly to mutual security through hosting U.S.-Australia joint defense facilities, participating in bilateral and multilateral military exercises, and supporting B-52 training flights and U.S. Navy port visits. Defense and intelligence cooperation is close and is now publicly acknowledged (for years, activities at Alice Springs were kept from the public eye).

Most Australians support the alliance with the United States. Nevertheless, the generation of Australians who remember with gratitude U.S. help during World War II is passing from the scene. Polls show that the younger generation of Australians, which is more likely to remember Vietnam than the Coral Sea, is less likely to accept U.S. positions uncritically.

Australia strongly supports a continued U.S. presence in the Pacific, including retention of the Philippine bases, and is concerned that budgetary and political developments may force a rapid U.S. drawdown. Our government has emphasized the U.S. commitment to remain in Asia, even as we take steps to restructure U.S. forces there.

The Australian left wing, including elements of Prime Minister Hawke's Australian Labor Party, opposes U.S. ship visits and joint defense facilities. Hawke has publicly recognized that hosting the joint facilities may make Australia a target in a nuclear war, but he has argued that the facilities' contribution to deterrence and arms control justifies the risk.

Economic Relations. The United States and Australia are important trading partners, with two-way trade exceeding $11 billion in 1989. From that trade the United States enjoyed a surplus of about $3 billion. U.S. investment in Australia totals over $30 billion; Australia's investment in the United States is about one-half as large. The United States is Australia's second largest investor and second largest export market. The two nations tend to share common interests in the Uruguay Round, particularly with regard to agricultural subsidies.

Real GDP growth in Australia was already slowing before the Persian Gulf crisis and is currently projected at 1.7%, down from 4.8% for 1989. Unemployment has increased to 7%, exceeding the 1988 average. Inflation remains above 7%.

The rural economy is especially troubled, with net farm income expected to decline 32% from 1989/90 levels. Without any government program, Australia has a rural crisis in wool and wheat. Currently, there are 4.2 million bales of wool in stockpile, and 20 million sheep were expected to be slaughtered in the near future because of lack of markets.

The Reserve Bank has sought to prevent Australian dollar appreciation in order to keep exports competitive. Interest rates have fallen by 200 basis points from 1989 levels.

In 1989 trade and current account deficits exceeded figures from 1988. Export value grew 11% over 1988 levels, compared with 25% export growth in 1988 over 1987. Imports grew by 18% in 1989. Last year, Australia produced 14 million tons of wheat, 13 million tons of which were exported. The price was $160 per ton. This year, the price is $60 per ton.

With gross foreign debt above U.S. $100 billion, interest payments exceed 20% of goods and services exports. Over half of foreign debt is held by the private sector, as firms have borrowed abroad to finance investment and takeovers. Tourism is an important industry, with Japanese tourism on the increase, representing something on the order of 30%.

At the time of the Codel visit, Australia was not supporting United Airlines' request to increase service to Australia through Tokyo. United is seeking to increase flights to seven a week.

International Issues of Special Interest for Australia. Australia was quick to condemn the Iraqi invasion of Kuwait, to endorse economic sanctions, and to send naval forces (three ships) to participate in a multinational force in the Persian Gulf. The Australian ships have participated actively in the enforcement of the international trade embargo against Iraq. President Bush and Prime Minister Hawke have maintained a tradition of annual talks.

Drug issues are of increasing concern in Australia. Most use today is of heroin or locally grown marijuana. Drug education is comparable to U.S. efforts in the 1960s. Contraband and security issues have been getting more attention, intelligence has improved, and seizures have been increasing.

The Cape York proposal was briefly explained as a proposal that provided an opportunity for the Australians to go beyond a resource-based economy.

MEETING: Tidbinbilla Tracking Station
Canberra, Australia

DATE: November 19, 1990

KEY OFFICIALS: Michael J. Dinn--Complex Director

Richard A. Colonna--NASA Representative

BACKGROUND:

The Tidbinbella complex is part of the Deep Space Tracking Network operated on a reimbursable basis with NASA. It is located approximately 40 kilometers southwest of Canberra near the Tidbinbilla Nature Reserve and employs about 180 Australian personnel.

The Canberra complex is designed to handle telemetry command tracking and navigation, and radio science in support of interplanetary and earth orbiting spacecraft. The Canberra station, along with the two other primary stations at Goldstone, California and Madrid, Spain are located at 120 degree intervals of longitude. Hence the network can provide continuous coverage of any deep space probe and are an invaluable backup for Earth orbiting spacecraft and the Space Shuttle.

The Canberra complex cost about $1 million annually or operate and is presently providing telecommunications to the Magellan (Venus), Galileo (Jupiter), and Ulysses (Sun) missions. In August 1989, the facility supported the Voyager 2 Neptune encounter. The Complex is also preparing to support the Mars Observer mission in September 1992.

NASA tracking facilities have been in existence in Canberra since 1965 and have participated in historically important science missions from the earliest Mariner photos of Mars through the present ambitious planetary satellite series. The complex presently has one 70 meter antenna and two 34 meter antennas for planetary missions and one 26 meter antenna for Earth orbiting spacecraft. In the future, it is intended to enhance the Deep Space network to enable the Search for Extraterrestrial Intelligence.

TOUR:

The Committee was given a tour of the facilities and observed ongoing tracking operations. In the operations signal processing center complex, operations personnel remotely controlled and monitored the performance of the 70 and 34 meter antennas and the reception and processing of the space craft signal. Signals from three spacecraft can be received and processed simultaneously.

The Committee gained a first hand understanding of the importance and operation of the Tidbinbilla facility and its relationship to the Deep Space Network.

MEETING: Australian Ministry for Industry, Technology, and Commerce

DATE: November 20, 1990

KEY OFFICIALS: Senator John Button, Minister for Industry, Technology, and Commerce

BACKGROUND:

Senator Button (b. 1933, Industrial Law, elected to Senate from Victoria in 1974, Labor Party) became Minister for Industry and Commerce in 1983, and then Ministry for Industry, Technology, and Commerce (MITAC) in 1984.

MITAC covers the development of manufacturing and tertiary industries and is organized around eight programs: industry development, innovation, international, industry research, corporate services and information, policy, the Commission for the Future (social and economic impacts of S&T), and industrial property (property rights issues).

MITAC is the parent department for a number of facilities that the CODEL will visit in Australia, including the Institute for Marine Science, the CSIRO Division of Applied Physics, the CSIRO Division of Radiophysics, and the Australian Nuclear Science and Technology Organization (ANSTO). For further information on these facilities, refer to separate reports in this notebook.

MITAC is also the department in the Australian government which, in December, 1989, endorsed the proposal by the Cape York Space Agency to establish a private, commercial space launch service on Cape York Peninsula. CYSA had sought the Government's endorsement to provide the confidence which potential equity partners suppliers, financiers, and customers needed for further progress to be made on the project. In reaching its decision, MITAC stated that it had no objection to the use of Soviet rockets and ground equipment, and that the siting was conditional upon the satisfactory resolution of a range of issues, including environmental impact, land use, Aboriginal concerns, security, technology transfer, and commercial arrangements.

DISCUSSION:

The Codel met with Senator Button to discuss matters of mutual interest, particularly the Cape York Spaceport project. Senator Button was pleased to hear that the Codel had actually visited the site on Cape York since very few people who are involved in the proposal have actually been there.

Chairman Roe said that the site visit had proven to be most informative and that the membership of the Committee on Science, Space and Technology remains very interested in the Cape York project. The Committee, Mr. Roe noted, supports the position of the Government of Australia that there will be no government investment in the project with the exception of infrastructure (e.g., schools, police and fire stations).

Senator Button expressed appreciation for the United States' position on the project. He indicated that the Cape York project was basically in a favorable position to move forward but that there needs to be more interest in the financial community if it is to be successful. He indicated that there would be no governmental subsidy and that he saw the only appropriate governmental roles as completion of the Environmental Impact Statement, the establishment of Range Safety Regulations, and in dealing with Aboriginal issues during the developmental phase.

There was a general discussion of the reasons why Cape York was considered a favorable launch location. The most important considerations are that rockets increase in efficiency as they approach the equator, the limited number of sites that are coastal with open range to the east, and the limited number of politically stable governments located near the Equator. The feasibility of the Cape York project is highly dependent on the availability of the Zenit rocket from the Soviet Union, but Mr. Button believes that there is a sufficient commitment on the part of the U.S.S.R. to move forward.

Senator Button expressed interest in the U.S. experience with environmental issues at the Kennedy Space Center at Cape Canaveral. Chairman Roe indicated that overall our experience has been quite good (see November 14 meeting discussion) and that the Kennedy Space Center is a major wildlife preserve that is home to a number of endangered species. However, the environmental movement was not in existence when Cape Canaveral was first developed and it was doubtful that a new spaceport could be developed anywhere today without having to meet a great number of environmental concerns.

There was also a discussion of the directions that Australia will be taking in science and technology in future years. Senator Button said that Australia believes that it is expending about the right amount on R&D activities based on their population. The Australian government has been encouraging a shift to private funding of R&D, and over the past five years the amount of private funding has doubled. There is a strong recognition that R&D is critical to a strong industrial base and that publicly financed R&D should be aimed at helping Australian industry. As a part of that attempt, Australia is attempting to force government R&D facilities to generate up to 30 percent of their annual funding from private sources or outside income. This is also causing Australians to watch the balance between basic and applied research. There is obvious Australian pride that with less than one percent of the world population a significant number of the scientific papers published in international scientific journals are contributed by Australians.

In closing, Chairman Roe indicated that he has established a program of International Interns with the Committee on Science, Space and Technology and would be interested in exploring the possibility of exchanging interns with the Australian Parliament.

MEETING: Foreign Affairs Ministry
Canberra, Australia

DATE: November 20, 1990

KEY OFFICIALS: The Honorable Neal Blewett
Minister for Trade Negotiations

BACKGROUND:

Dr. Neal Blewett is a former university professor who was elected to the Federal Parliament in 1977 as the Member for Bonython, South Australia.

Dr. Blewett was re-elected to the House of Representatives in the Federal general election of March 1990 and was appointed Minister for Trade Negotiations. He is also Minister Assisting the Minister for Industry, Technology and Commerce and Minister Assisting the Minister for Primary Industries and Energy.

U.S.-Australia Relationship - Bilateral relations are generally excellent. However, Australian concerns over U.S. trade policies (e.g. the Export Enhancement Program (EEP) and sugar tariff quotas) are matters of continuing concern. Dr. Blewett has been directly involved in the GATT Uruguay Round to seek resolution of these trade issues.

Economic Relations - The United States and Australia are important trading partners, with two-way trade exceeding $11 billion in 1989. From that trade, the United States enjoyed a surplus of about $3 billion. United States' investment in Australia totals over $30 billion; Australia's investment in the United States is about one-half as large. The United States is Australia's second largest investor and second largest export market.

Discussion of Selected Trade Issues

EEP - Protectionist tendencies are of concern to Australia, with agriculture of particular concern. It was asserted that USDA subsidies for wheat and other agricultural exports under the Export Enhancement Program harm Australia's agricultural export prospects. This assertion was challenged by the delegation, although it was pointed out that the overpopulation of Australian sheep was arrived at without government involvement. Blewett admitted that the Australian attempt to exploit a semi-monopoly position in wool was a blunder. He observed that there was very little flexibility in the European offer.

U.S. Sugar Quotas - At Australia's instigation, GATT found the U.S. sugar quota system incompatible with our GATT free trade obligations. We have changed to a tariff-quota system that the Australians fear will do little to open the U.S. market to Australian sugar. We have agreed to discuss sugar in the Uruguay Round. The delegation explained why sugar farmers in the U.S. fear direct competition with countries such as Brazil.

Title VII - The U.S. has named Australia -- along with Japan, Germany, Italy, France, Greece, and the EC -- as a country whose government procurement regulations harm U.S. exports. The USG will seek to have these regulations changed, particularly those which require a 30 percent offset on GOA purchases of foreign goods. The decision was spurred by Title VII of the Trade Act which requires that the President identify and enter into negotiations with countries that discriminate against U.S. exports in their government procurement policies, and that the USG retaliate against exports from those countries if negotiations are unsuccessful. Neither Australia nor any other country was designated as discriminating within the meaning of the act, so retaliation will not be mandatory if negotiations are unsuccessful.

Uruguay Round. In discussions about the Uruguay Round, there was concern expressed on both sides that some nations might be willing to settle for a very limited agreement. If so, Dr. Blewett feared that the tendency for retaliation would be heightened. There was also a discussion of the service industry as an area in which countries are seeking to exempt themselves. Finally, it was pointed out that one area of potential agreement from among the fifteen major areas under discussion is agreement on dispute resolution.

MEETING:	Australian Ministerial Roundtable
DATE:	November 20, 1990
KEY OFFICIALS:	Dr. W.J. McG. Tegart Secretary Australian Science and Technology Council
	Dr. Brendan Hammer Office of National Assessment Department of Defence
	Peter Lundy Senior Government Solicitor Office of Commercial Law
	Leslie Rymer Acting Assistant Secretary S&T Policy Branch Dep't of Industry, Technology, & Commerce
	Mary Braithwaite Principal Executive Office Higher Education Council
	Eric James Office of the Chief Scientist Departments of the Prime Minister & Cabinet
	Mr. David Phillips Assistant Secretary Department of Employment, Education, and Training
	Mr. Maurice Arundel Director of Space DSTO
	Mr. Greg Wood Acting Deputy Secretary Department of Foreign Affairs and Trade
	Mr. Ian Wilcock Assistant Secretary/Americas Branch Department of Foreign Affairs and Trade
	Mr. Murray Thomas Assistant Secretary Trade Competitiveness Branch Department of Foreign Affairs and Trade

Mr. Bill Nelson
Executive Officer/North America Section
Department of Foreign Affairs and Trade

Dr. Ian McCay
Acting Commissioner
Patents Office

Dr. J. Ted Stapinski
Chairman
National Committee on Space Engineering
Institute of Engineers

Mr. Peter Vallee
Executive Secretary
Australian Academy of Science

Ms. C. Astley-Boden
First Assistant Secretary
Office of the Chief Scientist

Dr. Terry Stokes
Counsellor
National Board of Employment, Education,
and Training

Dr. Guy Verney
Assistnat Secretary/IPP Branch
Department of Defence

Mr. John Ashe
Assistant Secretary
Environment Assessment Branch/DASETT

Mr. Geoff Leach
First Assistant Secretary
International Division/DASETT

Mr. Graeme Taylor
Assistant Secretary
Europe/Americas Branch/DASETT

Mr. Doug Stuart
Assistant Secretary
Aerospace & Biological Industries
Branch/DASETT

Mr. Ed Cory
Director, Space PolicyDivision
DASETT

Mr. David Phi
Director, America/N.Z./South Pacific
Section
DASETT

Mr. Wayne Furler
Environment Quality Branch
DASETT

BACKGROUND:

Mr. Tegart, who chaired the meeting from the Australian side, is the Secretary of the Australian S&T Council, the body which advises the Prime Minister on S&T matters. He is a member of the Australian Academy of Technological Science and Engineering, and serves as Chairman of its International Relations Committee.

In the spring of 1989, the S&T press carried stories of turmoil in the Australian science community. Scientists complained of inadequate budgets, obsolete equipment, and dismal career prospects. The government called for shifting some basic science funds to research more relevant to Australia's competitive economic health. For example, John Button, the Minister for Industry, Technology, and Commerce, wants to use S&T to rejuvenate manufacturing, a sector neglected while it rode the minerals boom of the 1960's and 1970's.

Specifically, the government has announced that it is prepared to put $100 million of new money into research each year, including the creation of up to fifty cooperative research centers. Each center would combine the talents and resources of scientists in universities, the CSIRO, other research groups, and "end users". In most cases, the end user will be industry, whose participation must be viewed with concern in light of the recession currently facing Australia.

The US/Australian S&T Agreement was first signed in 1968. In May, 1990, the US proposed an extension including an intellectual property rights annex and security obligations language. Australia has the extension under review, and a response is expected soon.

DISCUSSION:

The meeting was a two-hour open-ended discussion of S&T policy in both countries. Australia's S&T policies were represented by leading officials from all Australian government agencies involved in science, technology, international trade, and foreign policy.

After a welcome from Dr. Tegart, Mr. Roe discussed the role of the Committee in setting U.S. science and technology policy and the purpose of the Committee's visit, especially with respect to Cape York. He highlighted some of the perennial issues in U.S. S&T policy, including: big vs. little science; the relative weights of fundamental research vs. applied R&D; and the role of international cooperation in S&T.

Dr. Tegart asked how S&T policy issues are identified and resolved under the U.S. system. Mr. Roe and Mr. Mineta discussed the roles of the scientific community, the Administration, Congress, and the private sector in the process and emphasized the role of public hearings in building consensus around preferred policy directions. The Members are provided insight into the relations between the Administration and the Congress in the establishment of S&T policy, using the case of science education to illustrate how the Congress may reverse Administration policies. Dr. Tegart, Mr. Phillips, and Ms. Braithwaite, in response to questions from Mr. Roe and Mr. Mineta, described efforts by Australia to expand interest among young people in S&T careers. The Australian government does work with universities to expand interest in certain fields, although Mr. Tegart cautioned that the government is interested in identifying areas of strength, rather than picking winners. He also made the point that engineering in particular is prone to boom and bust periods.

Mr. Wood asked about whether there is political controversy within the U.S. system regarding international cooperation in S&T. Several delegation members discussed the Committee's role in the international aspects of the Space Station and the Superconducting Super Collider projects. There is a consensus that basic R&D ought to be supported equitably by all the nations of the world. As far as pre-industrial R&D, there seems to be a growing consensus that cooperative work is essential, so long as intellectual property rights are protected.

Mr. Roe and other delegation Members, in response to questions from Dr. Tegart and Dr. Stapinski, discussed several aspects of space policy. In particular, the Australian officials were curious about public support for space in the U.S.. The relation between NASA R&D and economic development in the U.S. was stressed, although the Australian officials remained somewhat skeptical that large expenditures for space could be "sold" to the Australian public on these grounds.

After a long discussion on elements of U.S. technology policy (HDTV, National Aerospace Plane, Super-computers, Federal technology transfer), Mr. Vallee initiated a dialogue on the role of Federal governments in science education. The problems are recognized in both countries -- the rate of Ph.D.'s granted to foreign-born students is too high, the educational process is not rigorous enough to prepare students for the demands of the modern workplace. The question is how can Federal governments intervene effectively to deal with these problems. Mr. Volkmer noted that the Federal role in secondary education is minimal, and that the Committee's activities are focussed on the college level. Mr. Mineta noted that while Federal support of education may only amount to a few percent, it may reach a high percentage in specific programs, and that the Committee has had a major impact in curriculum development and in publicizing the problems of science education.

MEETING: Australian Parliament

DATE: November 20, 1990

KEY OFFICIALS: Hon. Leo McLeay, Speaker of the House
Hon. Kerry Sibraa, President of the Senate

DISCUSSION:

The delegation payed a courtesy call on the two key Australian parliamentary officials.

BACKGROUND:

Australia follows a liberal, democratic, Westminster-style form of government, with a strict division of powers between the three branches of Government: The Parliament, the Executive, and the Judiciary.

Members of the House of Representatives are elected in single-member constituencies by a perferential voting system. The system provides that where there are more than two candidates for a seat and no candidate has an absolute majority of the votes cast when the electors' first preference votes have been counted, then the candidate with the smallest number of votes is eliminated and the second preference on the ballot papers marked in his name are distributed among the other candidates. The term of a House member is three years; a Speaker is chosen from members by secret ballot.

The Senate, whose Members serve six-year terms, reviews legislation passed by the House and ensures that the Executive branch of the Government remains accountable to Parliament. It has almost the same law-making powers as the House, except for money bills which must be initiated in the Lower House. It acts through a range of six-member Committees which examine all areas of Government responsibility.

The Current Situation. The Hawke government was reelected for the fourth time in March 1990. Hawke's Australian Labor Party (ALP) won 78 seats in the 148-seat federal parliament, seven seats fewer than in the previous parliament. The coalition won 69 seats and one independent was elected. There was virtually no change in the Senate (ALP 32, Coalition 34, Democrats 8, Other 2) where the Democrats retain the balance of power. The coalition narrowly edged the ALP in total popular vote, 50.2 percent to 49.8 percent.

Closely allied to Australia's trade union movement, Hawke's government represents a complex factional balance. The ALP won a crucial internal battle over its own left wing in September when the party's special national conference authorized the government to open up the entire Australian telecommunications market to competition from a privatized Aussat sold off to a combined Australian/foreign competitor.

The Liberal Party-National Party opposition coalition is led by John Hewson, parliamentary leader of the Liberal Party.

During the Codel visit, parliamentary proceedings turned nasty when the ALP finally found an opening to attack Hewson and end his eight-month honeymoon free of any significant criticism. The issue involved was means-testing for the family allowance, and the attack came from Treasurer Paul Keating, who charged that Hewson could not be trusted since he couldn't even deliver his own party on the means-testing issue.

MEETING: Country Team Briefing
Hong Kong

DATE: November 21, 1990

KEY OFFICIALS: The Honorable Richard Williams, Consul General
David Brown, Deputy Principal Officer
Hank Levine, Economics Officer (Mainland China)
Robert Goldberg, Political Officer (Taiwan)
James Harris, Special Agent-in-Charge, Drug Enforcement Administration

BACKGROUND:

Consular officials briefed the CODEL on the political situation in Hong Kong and the political and economic impacts of recent events in the People's Republic of China (PRC), and those issues likely to arise from the loss of Hong Kong's status as Crown Colony upon expiration of the British leases in 1997.

Discussions continue between the governments of China and Great Britain. In the joint PRC/British declaration of 1984 Hong Kong is guaranteed an autonomous future after it returns to Chinese sovereignty. The agreement further guarantees Hong Kong will have fiscal autonomy, its own currency, no central taxes, and freedom of religion. Nevertheless, Hong Kong still faces an uncertain future.

The basic question facing Hong Kong is the degree of confidence in the intent of the PRC to uphold both the spirit and the intent of the Joint Declaration of 1984. Consul General Williams reported that the people of Hong Kong were understandably disturbed by the harsh response of the Beijing Government to the demonstrations of June 1989 in Tiananmen Square. That has fueled higher levels of emigration but there are many who cannot leave because of immigration quotas in favored nations. Morale had improved since then, Williams stated, but had slipped in the last several months.

Williams described views of Hong Kong manifesting polar contrasts. Recruitment of senior servants and police was growing difficult as 1997 approached, and a rise in the crime rate had been noted. The promise of noninterference in the Hong Kong economy promised by the 1984 Basic Agreement is viewed with increasing skepticism. These concerns are manifested in growing emigration: 45,000 in 1989, an estimated 62,000 in 1990. However, only ten to fifteen thousand (from a population of six million) represent the highly skilled population of greatest concern to the government since they staff the world-class service industries at the heart of Hong Kong's prosperity.

The question about immigration quotas for Hong Kong residents who wish to leave prior to or after 1997 has been an important issue in recent years. Canada and Australia have been the favored destinations to date. Recent changes in U.S. immigration law, however, led the U.S. Consulate to forecast a 300% increase in visa applications during the next three years.

Economically, Hong Kong shows continuing strength as the shift from 1950s-era manufacturing to services continues and belies the gloom of political forecasts. The current unemployment rate is a mere 1.2 percent. 900 American firms and 19,000 Americans reside in the colony. Hong Kong's value to the PRC is demonstrated by the

creation of two million jobs in nearby provinces as a result of Hong Kong investment. Williams pointed out that forty percent of Chinese foreign exchange flows through Hong Kong (and 75 percent of the PRC's international trade) in arguing for continued "most-favored-nation" (MFN) trade status for Beijing. The Consulate has noted no large-scale capital outflow indicating a loss of confidence in Hong Kong's future. However, this does not reflect the decision of the Hong Kong and Shanghai Corporation to move its headquarters from the colony to a holding company in London.

The Port of Hong Kong is the major transshipment center for the entire Pacific Rim. A controversy has arisen over the plan to construct an eighth container port and a new airport. The $16 billion cost has been sharply criticized by the Beijing government, which desires assurance that it will not drain Hong Kong's financial reserves before 1997. Hong Kong believes a replacement for Kai Tak airport is vital to continued economic success. Three United States firms are major contractors for the project.

Hong Kong was criticized for attempts to forcibly repatriate Vietnamese "boat people" some months ago. In response to the delegation's query, Mr. Williams indicated that the police had dropped this policy in favor of finding those who would not resist return to Vietnam. Reuters recently reported that, in the past two years, nearly 7,000 volunteers returned to Vietnam under guarantees from Hanoi and the United Nations High Commissioner for Refugees.

Mr. Levine provided the delegation with the Consulate's latest estimate of the economic situation inside the PRC. The domestic economy had begun to slow during the third quarter of 1989; this accelerated during 1990. Because the Beijing government is reluctant to address remaining institutional problems in the economy, the Chinese are in an unhealthy situation. A recent upturn in the manufacturing sector went directly into inventories without affecting domestic consumption. Internationally, however, the Chinese had a record trade surplus in 1989 and expect a new record ($10-12 billion) for 1990.

U.S. investment in the PRC declined in the wake of Tiananmen, with U.S. firms either reducing or terminating the scope of their projects. However, at the time of the delegation's visit, France had just terminated sanctions imposed after the suppression of the Tiananmen demonstrations. Hong Kong maintained an even level of investment, while Taiwan increased theirs. Japan is increasing their already strong participation in the Chinese economy. While Japanese loans are allegedly "untied" from the purchase of Japanese goods, it is very difficult for U.S. companies to participate in Japanese-financed projects. The Consulate noted a recent upsurge in Japanese investment, but also reports a minor deficit in Japanese-PRC bilateral trade. The U.S., according to Levine, would be China's leading trading partner in 1990.

Levine argued that the United States should pursue stability and modernization in the PRC to support continued friendly relations and attempt to increase its market shares in the booming Pacific Rim countries. He proposed continued MFN status for Beijing, no legislative limits on U.S. investment in the PRC and increased government-backed loans to industry to reduce risks in large projects.

Levine and Williams both affirmed the need for greater exchanges between the U.S. and the PRC. Some Members of Congress had just returned form an informal visit to China; Mr. Williams urged Chairman Roe to accept an invitation to visit China for discussions on the Long March booster and the commercial space industry. The Chinese people needed greater access to outside information to broaden their understanding of the world.

MEETING: Kadena Air Base
Okinawa, Japan

DATE: November 23, 1990

KEY OFFICIALS: Brigadier General Joseph E. Hurd

Colonel John B. Hall, Jr.

Colonel Charles M. Heltsley, Jr.

BACKGROUND:

Kadena Air Base is located 15 miles north of Naha on the island of Okinawa -- about 500 miles south of mainland Japan. It is a Pacific Air Force base, and is headquarters for the 313th Air Division. The primary operational U.S. Air Force organization is the 18th Tactical Fighter Wing, with three squadrons (72 aircraft) of F-15 fighter aircraft.

Kadena is also home for the 961st Airborne Warning and Control Squadron, the 33rd Aerospace Rescue and Recovery Squadron, and the 13th Millitary Airlift Squadron. The base houses about 9,000 permanently assigned military personnel.

Kadena is strategically located to support several important military missions in the Pacific theater. It is a vital airlift link between the CONUS and Asia or the Indian Ocean. Air refueling tankers stage from the base to support tactical, reconnaissance, and airlift requirements in the region. It is a key link in strategic security intelligence operations. And the Pacific Air Forces' only air superiority assets -- the F-15s -- are home-based on the island. Additionally, much of the Pacific theater's Marine Expeditionary Forces are based on the island.

The Codel may a two-hour refueling stop at Kadena, and observed a demonstration by members of the 18th Tactical Fighter Wing of an F-15 Integrated Combat Turn (ICT). Simulating a combat turnaround which would follow a typical F-15 combat flight (such as in a Gulf war), the F-15 weapons load crew refueled and rearmed the aircraft with bullets and eight missiles in less than 30 minutes while wearing outer garments and masks for protection against would-be chemical contaminants.

The brief demonstration portrayed the Air Force's ability to perform critical operational tasks in a hostile chemical warfare environment, a subject of much public interest in light of Operation Desert Shield.

APPENDIX 1

MEETING: New Zealand Drug Enforcement and Treatment Officials,
Christchurch, New Zealand

DATE: November 12, 1990

KEY OFFICIALS: Kevin Burroughs, Criminal Investigator and Chief of Intelligence,
Christchurch, New Zealand

David Green, Substance Abuse Case Worker,
Christchurch, New Zealand

DISCUSSION:

Mr. Burroughs and Mr. Green provided a briefing on drug abuse and drug enforcement in New Zealand generally and Christchurch particularly.

While New Zealand in recent years has experienced increases in drug abuse as measured by criminal justice indicia, the level of abuse is still well below that in the United States. For example, in 1988, seizures of heroin and cocaine each equalled a total of about 3 kilos in New Zealand.

The last multiple kilo single seizure of heroin in New Zealand was in 1978, when 3 kilos were seized.

Mr. Green indicated that most of his work is with youthful substance abusers. Alcohol and marijuana are the major substances of abuse.

A recent phenomenen which has developed in New Zealand is the abuse of a substance known as "home bake". "Home bake" is produced by a cooking process to extract codeine from over-the-counter drugs, and the conversion of codeine to morphine base.

New Zealand has no equivalent of our Drug Enforcement Administration. At the national level, drug enforcement responsibility is assigned to New Zealand Customs authorities. Each locality is responsible for local enforcement efforts.

New Zealand participates in international efforts to reduce drug trafficking and drug abuse, and has personnel stationed in Sydney, Canberra, and Bangkok to participate in these efforts.

MEETING: Australian Opium Program
Launceston, Latrobe, and Westbury, Tazmania

DATES: November 16 AND 17, 1990

KEY OFFICIALS:

Peter Patmore
Attorney General of Tasmania

Julian Green
Chairman
Tasmanian Poppy Advisory and Control Board

Peter F. Williams
Director, Plant Industries
Department of Primary Industry, Tasmania

Barry Bennett
Tasmanian State Police

Wayne Smith
President
Tasmanian Poppy Growers Association

Michael Badcock
Executive Committee
Tasmanian Poppy Growners Association

Keith J. Rice
Executive Director
Tasmanian Poppy Growers Association

Hans Bosman
Managing Director
Tasmanian Alkaloids, Ltd.
Westbury, Tasmania

Staff Members
Glaxo, Ltd.
Latrobe, Tasmania

BACKGROUND:

On November 16 and 17, Congressman Hughes travelled to the island State of Tasmania to inspect the Australian legal opium production program.

The world licit opium market is regulated by a system of legal controls established by the 1961 Single Convention on Narcotic Drugs and monitored by the United Nations International Narcotics Control Board.

Australia is one three countries which are major producers of licit opium. Under a regulation promulgated by the U.S. Drug Enforcement Agency in 1981, U.S. pharmaceutical manufacturers must purchase at least 80% of their opiate raw materials from the other two major producers, India and Turkey.

This regulation, known as the "80-20 Rule", has been the subject of criticism in recent years. It has been the subject of two U.S. Congressional enactments requiring the executive branch to reexamine the rule and to report to the Congress on its continued efficacy. The most recent of these provisions, authored by Congressman Hughes, is title XXV of the Crime Control Act of 1990.

Accompanying Mr. Hughes at all meetings and discussions in Tasmania were Hayden Gregory, Counsel, Subcommittee on Crime, House Committee on the Judiciary, and Ms. Lisa Filipetto, North American Trade Section, Department of Foreign Affairs and Trade, Government of Australia, Canberra, Australia.

Upon arrival in Tasmania on the evening of November 16, Mr. Hughes held a dinner meeting with Attorney General Patmore, Chairman Green, Director Williams, and Officer Bennett, at which the role of the Australian and Tasmanian governments in the legal opium program was described.

First, a manufacturing quota is established by the Australian Department of Community Services and Health for the production of opiate alkaloids from poppies grown in Tasmania. (Poppy growing in Australia is limited to the State of Tasmania.)

That Department also regulates export of opiate alkaloids.

Cultivation of the poppy crop takes place under licenses issued to individual farmers by the Tasmanian state government, carried out by the Poppy Advisory and Control Board.

Security and law enforcement responsibilities are shared by State and National authorities. Field security is a State function, carried out jointly by the Control Board and Tasmanian Police.
Factory operations and movement of the product is monitored by these agencies and the Australian Protective Service, an administrative agency which has recently taken over routine monitoring from the Australian Federal Police.

On Saturday, November 17, field visits were made to poppy fields under cultivation and to the two companies which process poppies for medicinal production.

These on site visits and discussions indicated that, through close cooperation between regulatory and enforcement agencies, farmers, and the two producing companies, diversion of poppies or poppy products to illegal sources is kept to a minimum. Efforts to combat diversion are also aided by the fact that growing is confined to the island state of Tasmania, and by the fact that Australia used the concentrated poppy straw (CPS) method of extracting the opiate alkaloids from the poppies. CPS is a much less attractive target for diversion into heroin than is the opium gum produced in India, which has experienced, and continues to experience, significant diversion at the farmgate.

MEETING: Australian Federal Police
Canberra, Australia

DATE: November 20, 1990

KEY OFFICIALS: Peter Lamb, Assistant Commissioner (Investigations)

Lloyd Worthy, Commander, International Division

DISCUSSION:

Commissioner Lamb and Commander Worthy outlined the structure of Australian law enforcement so far as illegal drugs are concerned, and described the current enforcement situation.

The AFP, which was established in 1979, is the lead agency for national drug enforcement. AFP has about 2500 officers. It works cooperatively in the international drug enforcement community, and has agents in Bangkok and London.

Another agency with drug enforcement responsibility is the Australian Customs Service, which has responsibility at points of entry, but no authority to investigate "beyond the barrier".

The Australian Coast Guard does not exercise drug enforcement authority, but does search and rescue work. A unit within the Australian Customs, the Coast Watch, has responsibility for patroling Australia's 36,000 kilometers of coastal border.

Cooperation between law enforcement agencies is improving, but Australia does experience turf battles between its agencies.

Heroin continues to be the "drug of choice" in Australia. A kilo goes for about $100,000 Australian ($80,000 US). Broken down into street doses, a kilo brings about $1,000,000.

Cocaine is appearing in Australia, but not in epidemic proportions. Australia receives quite a bit of cannibis from Papua New Guinea, which has also begun to grow some coca. Australia is sending 20 police officers to Papua New Guinea to help with enforcement efforts in these areas.

There is very little "ice" (methamphetamine) showing up in Australia, and virtually no "crack" cocaine. There is some trafficking in amphetamines, mostly by motorcycle gangs.

Australia has new laws on forfeiture and money laundering, similar to those in the United States. The AFP officers indicated that the forfeiture law is of some benefit, but criticized it for not providing for police sharing in the proceeds obtained.

MEETING: Office of the Australian Attorney General
Parliament House
Canberra, Australia

DATE: November 20, 1990

KEY OFFICIAL: Attorney General Michael Duffy
Minister of Justice Michael Tate

DISCUSSION:

After introductions and opening conversation, Attorney General Duffy asked about Congressman Hughes' trip to Tasmania a few days earlier.

Mr. Duffy referred to the "80-20 rule" as a barrier in the trade world that Australia could do without. (The 80-20 rule requires U.S. companies to purchase at least 80 percent of their medicinal opium products from either India or Turkey.)

Mr. Hughes responded that he was skeptical of the wisdom of the 80-20 rule. He stated that, for him, it was not a trade issue but rather a law enforcement issue, in that he is concerned about the extent of diversion of opium into illicit markets taking place in India under the 80-20 rule.

Discussion turned to heroin production in the Golden Triange of Southeast Asia. Mr. Hughes expressed concern over the expansion of illicit opium production in Burma since the United States suspended its support of Burmese enforcement efforts. He indicated that he is in disagreement with U.S. policy which prevents us from working with the Burmese on narcotics issues because of other disagreement we have with them.

Minister Tate expressed concern regarding illegal opium production in Laos, which he said appears to be government sponsored.

Minister Tate inquired about the anti-drug abuse strategy of U.S. Narcotics Director William Bennett, indicating he understood the strategy to be one which relies predominantly upon enforcement.

Mr. Hughes responded that many members of Congress disagree with Mr. Bennett in this regard, and pointed to the fact that, in the Anti-Drug Abuse Act of 1988, Congress shifted more resources to demand reduction efforts. He also indicated that he and other members of Congress feel that the Bennett strategy focused almost all its attention on the casual drug user, and not enough on hard-core users.

MEETING: Australian Customs Service
Customs House
Canberra, Australia

DATE: November 20, 1990

KEY OFFICIAL: Mr. Frank Kelly
Comptroller General

DISCUSSION:

The Comptroller General is the head of the Australian Customs Service.

The Customs Service is responsible for import and export controls in Australia, which includes patrolling Australia's 37,000 kilometer coastal boundaries.

The responsibilities of the Service extend to drug enforcement, anti-dumping laws, liquor tariffs, strategic materials, and computer technology.

Mr. Kelly stated that the Customs Service is very proud of its record of computerizing its own records. In the trade area, this computerization has existed for 17 years. Tariff changes can be immediately accessed by industry by computer.

Drug enforcement responsibility is divided in Australia. Mr. Kelly explained that Customs is responsible for "the barrier" or border, but all investigative matters are turned over to the Australian Federal Police.

Money Laundering is handled by a separate agency, the Cash Transaction Reporting Agency. At points of entry and departure, Customs has enforcement responsibilities.

Customs Watch, a unit of the Customs Service, patrols Australia's borders. It conducts these activities on behalf of agencies with responsibility for matters such as drug enforcement, fisheries, and immigration. If actual enforcement action must be taken in Australia's border waters, the Navy or other units of the Department of Defense are called in.

MEETING: Department of Community Services and Health
Canberra, Australia

DATE: November 20, 1990

KEY OFFICIALS: Mr. Alan Bansemer, Deputy Secretary

Ms. Sue Terry, Assistant Secretary
Drugs Dependency Branch

Ms. Laurayne Bowler, Director, Drug
Monitoring Unit

DISCUSSION:

The Department of Community Services and Health has responsibility within Australia for substance abuse demand reduction, prevention, and treatment programs.

The Department also regulates the legal opium program. It licenses the two companies involved, and reports to the United Nations Fund for Drug Abuse Control regarding Australia's compliance with international agreements relating to the production of legal opium.

The Department also funds medical research on substance abuse.

Australia has underway a major national campaign to reduce substance abuse, which includes abuse of alcohol and tobacco.

In these efforts, Australia places primary emphasis on demand reduction. For them, the main policy debate is not over supply versus demand reduction efforts, but over the emphasis to be placed on education programs versus treatment programs.

Secretary Bansemer expressed the view that Australia does not do a very good job in the area of drug treatment. Mr. Hughes said the same was true in the United States. He said that policy makers, including himself, made a mistake in not earmarking some portion of the proceeds of asset forfeiture to demand reduction efforts. He would have set this at 25%.

The representatives of the Department indicated that Australia does not now share the proceeds of asset forfeitures with demand side agencies, but will in the near future. The division between law enforcement and demand reduction efforts is expected to be 50-50.

MEETING: U.S. Drug Enforcement Administration
Hong Kong

DATE: November 22, 1990

KEY OFFICIAL: James Harris
Country Attache-China Area
U.S. Drug Enforcement Administration

DISCUSSION:

Mr. Harris is the DEA Agent in Charge of the Hong Kong Office, which also has responsibility for Taiwan and the People's Republic of China.

Mr. Harris supervises a staff of five agents, one intelligence analyst, two local investigators, and an office assistant.

Two of the five agents are new additions. One has not yet arrived. Of the four present, three speak Chinese.

Mr. Hughes asked how our relationship with law enforcement authorities in the PRC is different now from that which existed before the June 4, 1989 incidents at Tianamen Square. Mr. Harris replied that DEA continues to work with PRC officials, but at a diminished level of activity. For example, DEA has conducted no formal training sessions for PRC law enforcement since June 4.

The PRC continues to cooperate in international and regional drug enforcement. PRC officials report that they have good cooperation with the Burmese in this respect.

Mr. Harris indicated that the chemical tracking legislation enacted by the Congress as part of the Anti-Drug Abuse Act of 1988 is proving valuable to his operations. The law provides DEA good intelligence on the movement of chemicals such as acetic anhydride into Southeast Asia, and gives them information to use in approaching governments in the region about suspicious shipments.

Harris indicated that, since Mr. Hughes last reviewed the Hong Kong office in the summer of 1989, the office has shifted primary emphasis to bigger cases--major heroin and money laundering cases. One case in which DEA recently participated resulted in a $20 million seizure. A 420 kilo shipment of heroin, which was bound for the United States, was made in Hong Kong last year.

DEA Hong Kong is currently working several major money laundering cases, one involving tens of millions of dollars. Harris indicated that the problems DEA encountered a few years ago because of Hong Kong bank secrecy laws have been lessened by new monetary disclosure laws enacted in 1989.

DEA is still encountering problems in Taiwan, particularly involving traffickers who flee there when the heat is on in Hong Kong or elsewhere. These problems are due in part to the fact that DEA does not have adequate resources to service its needs in Taiwan. DEA Hong Kong is only able to visit Taiwan about once a month.

DEA Hong Kong opened 17 investigations in fiscal year 1990, 4 of which involved money laundering. This is an increase from the 10 cases opened in 1989.

The quantity and quality or arrest cases in which DEA participated also went up in 1990. DEA participated in 68 cases which resulted in arrests in 1990, and over half of these were major offenders. In 1989, the number was 20 arrests, with only one-third classified as major.